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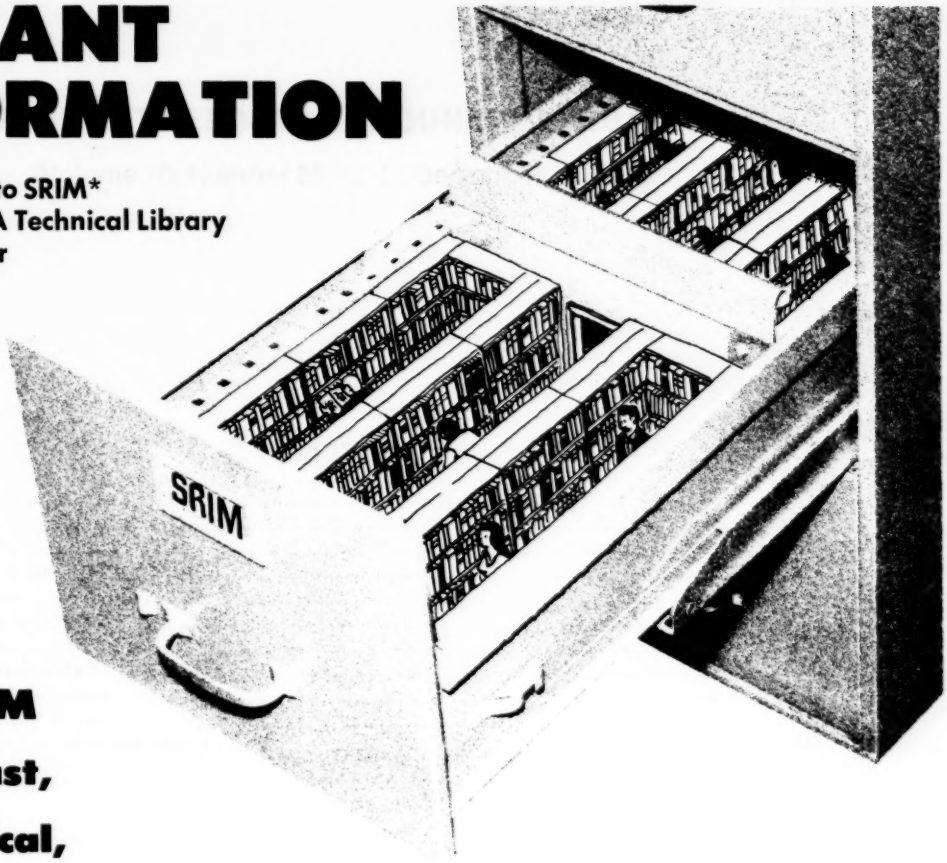

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GOVERNMENT REPORTS ANNOUNCEMENTS & INDEX

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Subject Field & Group Structure

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft, Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology, Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings; Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection, Communications, Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Nonpower); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory; Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

Sample Entries

Report entries are arranged by COSATI group and field. Within fields they are arranged alphanumerically by Accession (Order) Number - alphabetic data precedes numeric.

AD/A-003 266/4GA PC$6.25/MF$2.25
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Final rept. 16 Sep 67-15 Sep 73,
F.T. Ulaby, and R.K. Moore, Jun 74, 172p Rept no. CRES-TR-133-29 ETL-CR-74-10
Contract DAAK02-68-C-0089
See also AD-743 234.

Descriptors: *Radar mapping, *Target discrimination, Aerial reconnaissance, Data processing equipment, Preprocessing, Microwaves, Ultrasonic radiation, Image Intensification, Backscattering, Agriculture, Vegetation, Land use, Soils, Scattering, Spectrometry.
Identifiers: Themis project, *Remote sensing.

This report summarizes the technical work accomplished under Project THEMIS, A Center for Remote Sensing at the University of Kansas during the period 16 September 1967 through 15 September 1973. The highlights of the four major areas forming the remote sensing system are presented. A detailed description of the latest radar spectrometer results is presented.

Index entries are arranged alphanumerically. Titles are included in all indexes except Contract Number Index. Sample entries for each index follow:

Subject: Entries are sequenced by major subject term, second paired term, and accession number.

RADAR MAPPING
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Personal Author: Entries are sequenced by personal author, report title, and accession number.

MOORE, R. K.
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Corporate Author: Entries are sequenced by corporate author name, report number, and accession number. The monitor agency number is given following the report title.

KANSAS UNIV/CENTER FOR RESEARCH INC LAWRENCE REMOTE SENSING LAB
CRES-TR-133-29
Project THEMIS: A Center for Remote Sensing.
(ETL-CR-74-10)
AD/A-003 266/4GI

Contract Grant Number: Entries are sequenced by contract or grant number, corporate author, and accession number.

DAAK02-68-C-0089
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
AD/A-003 266/4GI

Accession/Report Number: Entries are sequenced by accession, report, or monitor agency number. Prices are given in this index.

AD/A-003 266/4GI
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI 8F PC$6.25/MF$2.25

REPORTS ANNOUNCEMENTS

1. AERONAUTICS

1A. Aerodynamics

AD-A015 830/3GA PC$5.75/MF$2.25
Systems Technology Inc Hawthorne Calif
Investigation of Flying Qualities of Military Aircraft at High Angles of Attack. Volume II. Appendices.
Final rept. 1 Mar 73-1 Mar 74,
Donald E. Johnston, Jeffrey R. Hogge, and Gary L. Teper. Jun 74, 144p Rept no. STI-TR-1033-2 AFFDL-TR-74-61-Vol-2
Contract F33615-73-C-3101
See also Volume 1 dated Jun 74, AD-A014 366.

Descriptors: *Military aircraft, *Aerodynamic characteristics, *Angle of attack, Maneuverability, Handling, Stalling, Recovery, Computerized simulation, Aerodynamic configurations, Mathematical models, Flight simulation, Assessment, Stability, Equations of motion, Degrees of freedom.
Identifiers: Stall departure, High angle of attack.

An investigation of handling qualities in stall-departure flight regimes has been conducted. The study involved key parameter identification, systems analysis and piloted simulation. The technical results and conclusions are detailed in Vol. I. This second volume contains support data in the form of appendices. These include equations of motion and the A-7 high angle of attack aerodynamic data used in the nonlinear six-degree-of-freedom digital simulation. It also contains stability derivatives and transfer functions evaluated at specific flight conditions near stall. The five-degree-of-freedom piloted simulation (analog) is described in detail.

AD-A015 850/1GA PC$4.25/MF$2.25
Stanford Univ Calif Dept of Applied Mechanics
Nonlinear Equations of Motion for Twisted Nonuniform Rotating Beams.
Technical rept.,
Dewey H. Hodges, and George Herrmann. May 75, 59p Rept no. SUDAM-75-6 AFOSR-TR-75-1276
Grant AF-AFOSR-2669-74

Descriptors: *Cantilever beams, *Rotor blades(Rotary wings), Equations of motion, Strain(Mechanics), Bending moments, Aerodynamic loading, Deformation, Vibration, Nonlinear differential equations, Partial differential equations.
Identifiers: Hamilton principle.

Nonlinear partial differential equations of motion suitable for describing bending in two directions and torsion of a rotating cantilevered beam are derived by use of Hamilton's principle. A nonlinear strain displacement relation is developed based on a newly constructed coordinate transformation and forms an important contribution to the final equations. In determining the order of various terms in the derivation, it is assumed that the squares of the bending (flap and lead-lag) slopes, of the torsion deformation, and of the chord/radius and thickness/radius ratios are small compared to unity, but otherwise all nonlinear terms are retained. Thus the more important nonlinear terms are identified. In addition to the product of bending curvatures (discussed by earlier authors) which generates a twist about the blade elastic axis, it is found that a product of bending curvature in one direction and twist generates a bending moment for the other direction of bending. In general all such terms are of equal physical importance and could substantially influence the stability and response of hingless or cantilevered helicopter rotor blades, particularly when such blades are significantly deformed under normal operating loads.

N75-29996/6GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
Aeronautical Engineering: A Special Bibliography with Indexes, Supplement 58.
Jun 75, 141p NASA-SP-7037(58)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1321

N75-30094/7GA PC$122.50
Engineering Sciences Data Unit, London (England).
Wave Drag of Wings at Zero Lift in Inviscid Airflow.
May 75, 17p ESDU-75004
Misc-Supersedes AERO-W.S.02.03.01. Subm-Sponsored by Roy. Aeron. Soc.

Descriptors: *Inviscid flow, *Wave drag, *Wings, *Zero lift, Aerodynamic coefficients, Aspect ratio, Graphs (Charts), Swept wings, Trailing edges.

For abstract, see STAR 1321

N75-30096/2GA PC$74.50
Engineering Sciences Data Unit, London (England).
Frequencies of Vertical and Lateral Load Factors Resulting from Ground Manoeuvres of Aircraft.
Jul 75, 11p ESDU-75008
Subm-Sponsored by Roy. Aeron. Soc.

Descriptors: *Airfield surface movements, *Fixed wings, *Loads (Forces), Graphs (Charts), Landing gear, Stresses, Taxiing, Undercarriages.

For abstract, see STAR 1321

N75-30097/0GA PC$36.00
Engineering Sciences Data Unit, London (England).
Information on the Use of Data Items on Flaps Including Estimation of the Effect of Fuselage Interference.
Jul 75, 7p ESDU-75013
Misc-Supersedes AERO-F.00.01.00. Subm-Sponsored by Roy. Aeron. Soc.

Descriptors: *Fuselages, *Interference lift, *Trailing-edge flaps, Aerodynamic coefficients, Aerodynamic drag, Interference drag, Lift, Pitching moments.

For abstract, see STAR 1321

N75-30099/6GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Approximate Method for Calculating Transonic Flow About Lifting Wing-Body Configurations: Computer Program and User'S Manual.
R. W. Barnwell, and R. M. Davis. Aug 75, 135p NASA-TM-X-72758

Descriptors: *Lifting bodies, *Transonic flow, *User manuals (Computer programs), *Wing profiles, Angle of attack, Computer programming, Digital data, Leading edges, Shock waves, Tables (Data).

For abstract, see STAR 1321

N75-30100/2GA PC$3.75/MF$2.25
Texas A&M Univ., College Station.
Transonic Airfoil Flowfield Analysis Using Cartesian Coordinates.
Final Report.
L. A. Carlson. Aug 75, 33p NASA-CR-2577
Contract NGR-44-001-157

Descriptors: *Airfoil profiles, *Cartesian coordinates, *Flow distribution, *Transonic flow, Conformal mapping, Finite difference theory, Iterative solution, Numerical analysis.

For abstract, see STAR 1321

N75-30101/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Simplified Lifting-Surface Theory for Flaps on Wings of Low and Moderate Aspect Ratios.
B. H. Wick. Sep 75, 9p NASA-TN-D-8060, A-6108

Descriptors: *Control surfaces, *Jet flaps, *Lift devices, *Low aspect ratio, *Wings, Aerodynamic coefficients, Aerodynamics, Incompressible flow, Lift, Wing loading.

For abstract, see STAR 1321

N75-30102/8GA PC$5.75/MF$2.25
Computer Sciences Corp., Hampton, Va.
Three-Dimensional Dynamics of Scientific Balloon Systems in Response to Sudden Gust Loadings.
D. R. Dorsey, Jr.. 1975, 133p NASA-CR-132701
Contract NAS1-12527

Descriptors: *Dynamic response, *Gust loads, *High altitude balloons, *Three dimensional motion, *User manuals (Computer programs), Computerized simulation, Coriolis effect, Digital computers, Mathematical models, Viscous damping.

For abstract, see STAR 1321

N75-30103/6GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Effects of Spanwise Blowing on the Pressure Field and Vortex-Lift Characteristics of a 44 Deg Swept Trapezoidal Wing.
J. F. Campbell. Jun 75, 141p NASA-TN-D-7907, L-10047

Descriptors: *Aircraft models, *Lift, *Pressure distribution, *Swept wings, *Vortices, *Wind tunnel stability tests, Aerodynamic characteristics, Angle of attack, High aspect ratio, Leading edges, Tables (Data), Wind tunnel models.

For abstract, see STAR 1321

N75-30104/4GA PC$6.25/MF$2.25
Boeing Commercial Airplane Co., Seattle, Wash.
Prediction of Unsteady Aerodynamic Loadings Caused by Leading Edge and Trailing Edge Control Surface Motions in Subsonic Compressible Flow: Analysis and Results.
Final Report.
W. S. Rowe, M. C. Redman, F. E. Ehlers, and J. D. Sebastian. Aug 75, 154p NASA-CR-2543
Contract NAS1-12020

Descriptors: *Aerodynamic loads, *Compressible flow, *Leading edges, *Lifting bodies, *Trailing edges, Aeroelasticity, Computer programs, Predictions, Structural vibration.

For abstract, see STAR 1321

N75-30105/1GA PC$5.75/MF$2.25
Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.
Theory of an Airfoil Equipped with a Jet Flap under Low-Speed Flight Conditions.
Final Report.
F. L. Addessio, and J. G. Skifstad. Jul 75, 141p NASA-CR-2571
Contract NGL-15-005-094

Descriptors: *Airfoils, *Incompressible flow, *Inviscid flow, *Jet flaps, Aerodynamics, Control surfaces, Flight conditions, Flow distribution, Jet flow, Lift devices, Wings.

For abstract, see STAR 1321

N75-30107/7GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Low Speed Wind Tunnel Investigation of a Large-Scale Advanced Arrow Wing Supersonic Transport Configuration with Engines Mounted Above the Wing for Upper-Surface Blowing.
AN EARLY DOMESTIC DISSEMINATION REPORT.
J. P. Shivers, H. C. Mclemore, and P. L. Coe, Jr.. Aug 75, 69p NASA-TM-X-72761
Contract PROJ. FEDD

Descriptors: *Arrow wings, *Low speed stability, *Low speed wind tunnels, *Supersonic transports, Aerodynamic stability, Aircraft configurations, Controllability, Wind tunnel stability tests.

For abstract, see STAR 1321

N75-30108/5GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Flow Visualization of Leading-Edge Vortex Enhancement by Spanwise Blowing.
G. E. Erickson, and J. F. Campbell. Sep 75, 108p NASA-TM-X-72702

Descriptors: *Flow visualization, *Leading edges, *Swept wings, *Vortices, *Wind tunnel stability tests, Aerodynamic configurations, Angle of attack, Photographs, Trailing-edge flaps, Wind tunnel models, Wind tunnel nozzles.

For abstract, see STAR 1321

N75-30109/3GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Free-Flight Model Investigation of a Vertical-Attitude VTOL Fighter.
W. A. Newsom, Jr., and E. L. Anglin. Sep 75, 34p NASA-TN-D-8054, L-10345
Misc-Technical Film Supplement L-1186 Available on Request.

Descriptors: *Aircraft stability, *Attitude control, *Vertical takeoff aircraft, Flight tests, Stability derivatives, Wind tunnel tests.

For abstract, see STAR 1321

N75-30112/7GA PC$7.00/MF$2.25
Deutsche Gesellschaft fuer Luft- und Raumfahrt, Cologne (West Germany).
Force Measurements on Parts of Wind Tunnel Models.
1975, 198p DLR-MITT-75-02
Conf-Proc. Of the Meeting of the Dgir Sci. Comm. 3.4 on Flow Mech. Testing Tech., Bremen, 5 Jun. 1973.
In German; English Summary.

Descriptors: *Aerodynamic forces, *Aircraft parts, *Missile components, *Strain gage balances, *Wind tunnel models, Aerodynamic loads, Aircraft models.

For abstract, see STAR 1321

N75-30190/3GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Summary of Information on Low-Speed Lateral-Directional Derivatives Due to Rate of Change of Sideslip beta Prime.
P. L. Coe, Jr., A. B. Graham, and J. R. Chambers. Sep 75, 52p NASA-TN-D-7972, L-10112
Subm-Prepared in Cooperation with Joint Inst. For Acoustics and Flight Sci.

Descriptors: *Aerodynamic stability, *Lateral stability, *Sideslip, *Stability derivatives, Aerodynamic stalling, Angle of attack, Delta wings, Numerical analysis, Swept wings.

For abstract, see STAR 1321

N75-30543/3GA PC$4.25/MF$2.25
Raytheon Co., Sudbury, Mass. Advanced Development Lab.
Data Analysis Study and Performance Evaluation of the Scanning Laser Doppler System.
Interim Report.
C. M. Sonnenschein, C. A. Dimarzio, and D. H. Clippinger. 16 Dec 74, 51p NASA-CR-143928, ER74-4449
Contract NAS8-30795

Descriptors: *Aircraft engines, *Data processing, *Laser doppler velocimeters, *Performance tests, *Scanners, *Vortices, Airfield surface movements, Airports, Algorithms, Computerized simulation, Real time operation, Velocity measurement.

For abstract, see STAR 1321

1B. Aeronautics

AD-A015 803/0GA PC$7.50/MF$2.25
Mcdonnell Douglas Corp Long Beach Calif
Bird Strike Alleviation Techniques. Volume I. Technical Discussion.
Final rept. 18 Feb 74-18 Feb 75,
James H. Lawrence, Jr., A. B. Bauer, C. A. Childers, M. J. Coker, and R. K. Eng. Feb 75, 250p Rept no. MDC-J6840 AFFDL-TR-75-Vol-1
Contract F33615-74-C-3038

Descriptors: *Bird strikes, *Aviation safety, Deterrence, Detectors, Protective equipment, Windshields, Lamps, Laser beams, Impact shock, Hazards, Warning systems, Acoustic equipment, Radar equipment, Electronic equipment.
Identifiers: Alternatives, Recommendations, Innovations.

This report presents an applicable series of exploratory studies, innovative design concepts and analytical methods associated with techniques to alleviate bird strike hazards to aircraft and crew compartments. In an endeavor to reduce the probability of aircraft/bird mid-air collisions research has been directed to bird deterring and detection systems, crew compartment protection devices, windshield designs, and analytical methods for future windshield/supporting structure bird impact designs.

AD-A015 804/8GA PC$5.75/MF$2.25
Mcdonnell Aircraft Co St Louis Mo
Interface of Fighter Throttle/Energy Management Functions with Dais.
Final rept. 22 May 74-30 Apr 75,
G. G. Grose, R. G. Marsh, and R. D. Turner. Jun 75, 147p AFFDL-TR-75-60
Contract F33615-74-C-3103

Descriptors: *Jet fighters, *Energy management, *Flight control systems, Avionics, Throttling, Digital simulation, Flight paths, Aircraft intercept control systems, Computer programming.
Identifiers: F-4 aircraft, Digital avionics information system.

A throttle/energy management (T/EM) concept for fuel, range, time optimization was extended by application to the Air Force Digital Avionics Information System (DAIS). The current state-of-technology of automatic throttles was reviewed, considering features applicable to a T/EM system. The functional requirements of a T/EM system for fighter aircraft were defined, based on analysis of the aircraft characteristics and flight control system of the Advanced Development Program 680J configured F-4. Computational algorithms and control laws were developed by digital simulation. The T/EM system uses stored data for a limited set of optimal acceleration, dash and descent segments, from which the control commands and performance for a specific mission would be calculated.

AD-A015 870/9GA PC$5.75/MF$2.25
Federal Aviation Administration Washington D C Office of Systems Engineering Management
Airline Delay Trends, 1972 - 1973 Study of Block Time Delays Ground and Airborne for Scheduled Air Carriers. Volume I. Summary.
Final rept.,
Seymour M. Horowitz. Jun 75, 136p Rept no. FAA-EM-74-11-Vol-1

Descriptors: *Commercial aviation, *Delay, *Air traffic control systems, *Scheduling, Time, Arrival, Flight paths, Airports, Data bases, Statistical data.
Identifiers: DOT/4IZ/Id.

Estimates of block time delays for the nation's domestic scheduled air carriers operating out of 20 major airports were determined from a data base recently made available by the CAB. This data base provides monthly averages of operational times, both airborne and on the ground, for all route segments receiving scheduled air carrier service, but the data in this report are limited to 325 route segments connecting with the 20 airports included in this study. Block time delays are those encountered from ramp to ramp on a route segment. Average monthly estimates of the delays for the airborne portion of the segment (wheels off to wheels on) are provided for a two year period from 1972 to 1973, and are categorized according to (1) route segment, (2) airline (3) aircraft type and (4) local scheduled arrival or departure time. Average monthly estimates of the ground portion of the route segment are categorized according to arrival and departure ground times at the 20 specific airport locations connecting the network of routes included in the study. Estimates of arrival and departure ground delays at specific airports are categorized further into Busy and Dull time intervals. (Author)

AD-A015 980/6GA MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee I - Procedures and Special Subjects.
1975, 323p
See also AD-A015 979 and AD-A015 981.
Availability: Available in microfiche only.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight

instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A016 161/2GA PC$9.50/MF$2.25
Federal Aviation Administration Washington D C Aviation Forecast Branch
Profiles of Scheduled Air Carrier Operations by State Length. Federal Aviation Administration Regions' Top 100 U.S. Airports. November 1, 1974.
May 75, 343p
See also report dated Jan 73, N73-22207.

Descriptors: *Air transportation, *Airports, Operation, Statistical data, Scheduling, Regions, Arrival, Takeoff, Passenger aircraft, Cargo aircraft, Diurnal variations.
Identifiers: DOT/2A, DOT/3C.

The first section of this report provides data on total scheduled air carrier aircraft operations by trip length by hour of the day for Friday, November 1, 1974, for the top 100 airports within the 50 states of the United States and the District of Columbia. The second section of the report shows the same information for each of the 11 Federal Aviation Administration regions. The FAA regional information is for those airports in the region that are included in the top 100 airports.

AD-A016 277/6GA PC$3.25/MF$2.25
Federal Aviation Administration Washington D C Office of Aviation Medicine
To See or Not to See: Visual Acuity of Pilots Involved in Midair Collisions,
Leonard C. Ryan, S. J. Gerathewohl, Stanley R. Mohler, and Charles F. Booze, Jr. Sep 75, 6p
Rept no. FAA-AM-75-5

Descriptors: *Aviation accidents, *Visual acuity, *Pilots, Records, Surveys, Comparison, Correlation techniques, Collisions, Classification.
Identifiers: Midair collisions.

The medical records of airmen involved in midair collisions from 1970 through 1973 were reviewed and compared with two other groups of pilots: (1) pilots involved in other types of accidents and (2) pilots without any accident records. There is nothing in the results to indicate that the pilots with visual corrections are a greater risk.

PAT-APPL-471 384/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Aircraft Barricade Jet-Net.
Patent Application,
Perry R. Digiovanniantonio, William Zimmers, and Charles E. Rivers, Jr. Filed 20 May 74, 10p
Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aircraft landings, *Arresting gear, Patents, Straps, Nylon, Energy absorbers.
Identifiers: PAT-CL-244-110, *Patent applications.

The patent application relates to a webbing assembly for arresting the motion of an aircraft, comprising three rectangular loops, each having a plurality of spaced vertical members, and constructed of nylon straps reinforced with polyurethane-coated nylon edging. The loops are joined side by side to form a barricade or net. The vertical members are each attached to the respective loops without the use of hardware, and are free to move laterally along the lengths thereof within defined limits. Upon engagement of the vertical members by the aircraft's wings, the barricade, which is attached on either side to an energy absorbing device, moves in the direction of motion of the aircraft to equalize loading and arrest the forward motion of the aircraft.

1C. Aircraft

AD-A015 632/3GA MF$2.25
Vought Helicopter Corp Grand Prairie Tex
Fan-in-Fin Failure Rate and Scrap Analysis.
Final rept.,
J. K. Davidson. Mar 75, 242p
Contract DAAJ02-73-C-0007
Availability: Available in microfiche only.

Descriptors: *Helicopters, *Tail helicopter rotors, *Shrouded propellers, Reliability, Maintenance, Maintainability, Life cycles, Costs, Aviation accidents.
Identifiers: Alouette aircraft, Gazelle aircraft.

This report presents an analysis of field-collected reliability, maintainability, and cost data reported for selected fleets of Alouette II, Alouette III, and SA 341 helicopter antiorque systems that accumulated 10,000 to 15,000 flight hours per aircraft model. The purpose of this program was to study the reliability, maintainability, safety and cost characteristics of an antitorque systems of the fan-in-fin type compared with an equivalent antitorque system of the conventional tail rotor type, in order to furnish bench mark data for the design of furture helicopter antitorque systems. The Aerospatiale built SA 341 Gazelle was monitored in commercial operations for the fan-in-fin data. Both the Alouette II and Alouette III (also made by Aerospatiale) were monitored in commercial operations to obtain the conventional tail rotor data.

AD-A015 645/5GA PC$5.25/MF$2.25
Mantech of New Jersey Corp Rockville Md
Avionics Module Repair Improvement Program Management Information System (AMRIP - MIS).
Final rept.,
Stephen S. Wood, and Randall R. Moore. Jun 75, 124p NAVWESA-R-7508

Descriptors: *Aircraft, *Avionics, *Management information systems, Maintainability, Operational readiness, Modules(Electronics), Microelectronics, User needs, Computer programs.
Identifiers: Avionics module repair improvement program.

This report describes an automated Management Information System for the Avionics Module Repair Improvement Program (AMRIP-MIS). The system permits the maintenance of updated files on AMRIP-certified personnel, equipment, and repair facilities. It also has the capability of providing management with selected summaries that may be used as timely status reports or to schedule training, periodic recertification of personnel and repair facilities, and delivery of equipment.

AD-A015 726/3GA PC$6.25/MF$2.25
Payne Inc Annapolis Md
Stability and Limb Dislodgement Force Measurements with the F-105 and ACES-II Ejection Seats.
Final rept. 1 Nov 73-31 Jan 75,
Peter R. Payne, Fred W. Hawker, and Anthony J. Euler. Jul 75, 161p Rept no. Working paper-119-7 AMRL-TR-75-8
Contract F33615-74-C-4015

Descriptors: *Ejection seats, *Stress(Physiology), *Extremities, Aerodynamic forces, Restraint, Flight crews, Joints(Anatomy), Displacement, Knee(Anatomy), Arms(Anatomy), Hands, Feet, Loads(Forces), Pitch(Motion), Yaw, Angles, Wind tunnel tests, Jet fighters, Flight helmets, Neck(Anatomy), Wounds and injuries, Static stability, Instability, Free flight, Deceleration, Stabilization, Variations, Human factors engineering, Pilots.
Identifiers: ACES(Advanced Concept Ejection Seat), Advanced concept ejection seat, F-105 aircraft, Flailing.

Forces on the arms and legs of test subjects seated in the F-105 and ACES-II ejection seats were measured over a range of speeds in a wind tunnel. It was found that the forces varied considerably between individuals. The variation was not identified with any outwardly visible physical features of the individuals. Averaged values for the group were compared over a range of pitch and yaw angles and between two different seats. Outward force at the knee was found to vary systematically with yaw angle up to 30 deg, and to be little affected by pitch, and to be practically the same on both seats. Forces at the feet and hands showed less systematic variation and were different between the two seats. Attempts to modify the forces by appurtenances attached to the limbs succeeded only in reducing them for some conditions at the expense of others. Both seats were shown to be statically unstable, with and without occupant, in free flight. Static stability was exhibited when equipped with an array of in-plane stabilizer plates on both the F-105 and ACES-II ejection seats. Pressures inside the helmet, and overall forces tending to remove it, were also measured. Powerful lift forces were derived from low pressures over the outside, quite sufficient to ensure helmet loss at high speed, unless the retention strap is designed to react large loads; in which case, some form of neck injury can be anticipated.

AD-A015 746/1GA PC$7.25/MF$2.25
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
A Stability Analysis of Tandem Parachute Mid-Air Recovery Systems.
Final rept.,
Michael W. Higgins, and Ralph J. Speelman, III. May 75, 219p Rept no. AFFDL-TR-74-149

Descriptors: *Parachutes, *Payload, Recovery, Parachute descents, Airborne, Aerodynamic stability, Descent trajectories, Control systems, Time, Rates, Remotely piloted vehicles, Lightweight, Weight, Parachute canopies, Gliding, Helicopters, Pilots, Flight speeds, oscillation, Computer programs.
Identifiers: *Midair recovery system, MARS(Midair Recovery System), Tandem parachutes.

The objective of this report is to present the derivation and application of an analytical technique to quantitatively predict and measure the performance/stability of a tandem parachute Mid-Air Recovery System (MARS). In this system, a main parachute is used to control the rate of descent of the payload and a smaller parachute, tethered to the apex of this main chute, serves as an engagement target for the recovery aircraft. Significant parameters relevant to the position and stability of the engagement parachute are identified and quantified. Those parameters relevant to system stability, as viewed by the pilot of the retrieval aircraft, are combined into a single numerically valued stability factor. Sensitivity of the stability factor to variation of its components is assessed. The stability quantification technique is applied to flight test data from two different systems. On one system, the performance of gliding and nongliding main canopy configurations is analyzed and compared. For the other system, an estimation is made of the potential change in performance obtainable through conversion from a non-gliding to a gliding main parachute. Potential refinements of the stability quantification technique to improve its sensitivity are presented. (Author)

AD-A015 855/0GA PC$3.75/MF$2.25
California Univ Los Angeles Dept of Mechanics and Structures
Application of Optimality Criteria to Stress Limited Structural Design.
Interim rept.,
M. W. Dobbs, and R. B. Nelson. May 75, 49p
Rept no. UCLA-ENG-7533 AFOSR-TR-75-1431
Grant AF-AFOSR-2640-74

Descriptors: *Aerospace craft, *Weight reduction, Optimization, Structural properties, Stresses, Mathematical programming, Recursive functions.
Identifiers: *Structural design.

This report presents a recursive design method for the minimum weight design of linear elastic redundant structures subject to multiple independent static loading conditions and with behavioral constraints on allowable internal stresses and side constraints on design variables. This recursive method is based on the Kuhn-Tucker test for a local optimum and gives, upon completion, a true local optimum design. In this method the values of the design variables are modified to drive the design to a point in the design space satisfying the Kuhn-Tucker test. Satisfaction of the Kuhn-Tucker test requires knowledge of which constraints are active, that is, critical at the optimum design. Selecting the set of active constraints for stress limited design is difficult because many more stress constraints exist than are active in the final design. Therefore, one or more iterations or redesigns are necessary. The recursive method presented herein allows automatic constraint selection and requires only the solution of a set of simultaneous linear algebraic equations at each iteration. The results of the application of the recursive method to several well known truss type structures are shown to compare favorably to results obtained using mathematical programming and other optimality criteria methods.

AD-A015 871/7GA PC$4.25/MF$2.25
Federal Aviation Administration Washington D C Office of Aviation Policy
The General Aviation Industry. --An Overview--.
Staff study rept.,
Thomas F. Henry, and Maryann Froehlich. Jul 75, 64p Rept no. FAA-AVP-75-4

Descriptors: *Aircraft industry, United States, Commercial aircraft, Jet transport planes, Transport aircraft, Utility aircraft, Manufacturing, Industrial production, Fuel consumption, Aviation fuels, Jet engine fuels, Cost analysis, Aviation safety, Industrial personnel, Industrial plants, Air traffic, Air Transportation, Statistical analysis, Commerce, Government(Foreign).
Identifiers: Balance of payments, Exports.

This report presents background information and statistics on various aspects of the general aviation (G.A.) industry. The report documents the impressive growth of the general aviation fleet, particularly since the 1960's, and illustrates recent trends in G.A. aircraft types and user categories. It emphasizes that G.A. activities are becoming increasingly important in the National Aviation System of Airports and Airways and that this implies increased FAA workload. The report also discusses trends in aircraft production and export and the relative market shares of the producers of G.A. aircraft, as well as the industry's overall contribution to the U.S. balance of payments. The discussion of energy considerations suggests that the Arab oil embargo and subsequent increases in oil prices brought on by the pricing policies of the Organization of Petroleum Exporting Countries (OPEC) had minimal effects on G.A. activities. However, legislative proposals designed to impose substantial taxes on gasoline production or sale might have depressing effects on future G.A. activities. (Author)

AD-A015 891/5GA PC$4.75/MF$2.25
Boeing Co Wichita Kans Wichita Div
Mechanical Power Package for Aircraft Utility Functions, Power Controller Development.
Final rept. May 72-Jul 74,
J. D. Dudley, and F. B. Moffett. Sep 75, 79p
AFAPL-TR-75-58
Contract F33615-72-C-1577

Descriptors: *Aircraft, *Flight control systems, Springs, Clutches, Flywheels, Power equipment parts, Experimental design.

The utilization of kinetic energy stored in a high-speed flywheel for actuation of airplane utility functions required a device for converting unidirectional input rotation to selectable bidirectional output rotation. This program was initiated to develop a lightweight device for this purpose. A spring clutch concept was selected for development. Clutch engagement was accomplished at input speeds to 8686 rpm with limited output shaft inertia. Although uniform acceleration was attained, material problems encountered preclude satisfactory engagement at the desired load. Endurance relative to use in low inertia applications was not demonstrated due to these material problems.

AD-A015 978/0GA PC$5.75/MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Conference Agenda.
1975, 128p
See also AD-A015 979.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

This report contains the agenda for a conference called to discuss proposals relative to standards governing the airworthiness of commercial and general aviation aircraft. Eight other related documents contain the committee reports relative to flight characteristics, airframes, power plants, and various aircraft equipment.

AD-A015 979/8GA PC$9.25/MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Proposals Not in Agenda.
1975, 304p
See also AD-A015 978 and AD-A015 980.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 981/4GA PC$10.00/MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee II - Flight.
1975, 353p
See also AD-A015 980 and AD-A015 982.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 982/2GA MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee III - Airframe (Large Airplanes).
1975, 371p
See also AD-A015 981 and AD-A015 983.
Availability: Available in microfiche only.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 983/0GA MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee III - Airframe (Small Aircraft and Rotorcraft).
1975, 136p
See also AD-A015 982 and AD-A015 984.
Availability: Available in microfiche only.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 984/8GA PC$9.25/MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee IV - Powerplant.
1975, 325p
See also AD-A015 983 and AD-A015 985.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 985/5GA MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Committee V - Equipment.
1975, 250p
See also AD-A015 984 and AD-A015 986.
Availability: Available in microfiche only.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A015 986/3GA PC$5.75/MF$2.25
Federal Aviation Administration Washington D C Flight Standards Service
Airworthiness Review Conference (First Biennial) 1974-1975. Supplement.
1975, 132p
See also AD-A015 985.

Descriptors: *Commercial aviation, *Commercial aircraft, *Aviation safety, *Meetings, Aircraft equipment, Airframes, Flight instruments, Flight maneuvers, Aircraft landings, Takeoff, Runways, Regulations.
Identifiers: *Airworthiness, *General aviation, DOT/4DZ/DA.

No abstract available.

AD-A016 117/4GA PC$4.25/MF$2.25
Cobro Corp Silver Spring Md
RMAC Analysis of CH-47 Helicopter.
Final rept. 1 Jul 74-15 Aug 75.
15 Aug 75, 72p USAAVSCOM-TR-75-38
Contract DAAJ01-74-C-1025
Report on Reliability, Maintainability, Availability and Cost (RMAC) Analysis.

Descriptors: *Helicopters, *Reliability, *Maintainability, *Cost effectiveness, Spare parts, Inventory control, Failure(Mechanics), Maintenance, Costs, Removal, Logistics, Army aircraft.
Identifiers: H-47 aircraft, CH-47 aircraft, *Failure analysis.

An in-depth analysis was made of the reliability, availability, maintainability and cost of the CH-47 helicopter. The study was based on available Army documentation of the A, B, and Coversions of the helicopter design; the record of component failures and removals as reflected in the Army's RAMMIT Major Item Removal Frequency (MIRF) reports; the system mission and plan for use; the Disassembly and Inspection Reports covering engineering assessment of removed failed components; and the costs in material, labor and time stemming from removal/replacement of a component. The analysis was carried out using the Army's computerized 'Analytic Methodology for System Evaluation and Control (AMSEC), together with special techniques and algorithms which were developed as required. The report provides, for the system and for each component of each version, the current RMAC assessment; a cross-comparison between the three versions; an analysis of the impact on RMAC of changes in maintenance plans, or of different costs of mission failure; and an interpretation of DIR information as it bears on RMAC.

AD-A016 120/8GA PC$4.25/MF$2.25
Army Aviation Systems Command St Louis Mo
Heavy Lift Helicopter Engine Development Program Design to Cost, 2nd Period Award Fee Evaluation Report.
Final rept.,
Conrad W. Faber. Aug 75, 56p Rept no. USAAVSCOM-TR-75-41

Descriptors: *Helicopters, *Helicopter engines, *Production engineering, *Cost analysis, *Gas turbines, Contracts, Life cycles, Value engineering, Maintainability, Spare parts, Management planning and control.
Identifiers: T-701 engines, *Design to cost, Heavy lift helicopters.

During development of a 8079 shaft horsepower gas turbine engine, the contractor proformed an extensive design to cost effort under an award fee provision. This report summarizes the government's evaluation of this effort and includes a description of the contractor's design to cost policy and procedures.

AD-A016 126/5GA PC$9.25/MF$2.25
Parks Coll of Saint Louis Univ Cahokia Ill
Critical Parts Program UH-1H, AH-1G, OH-6A, OH-58A, CH-47, and CH-54 Aircraft.
Final rept. 1 Jul 74-24 Aug 75,
William E. Brand, Richard L. Humphrey, and John P. Diani. 22 Aug 75, 324p USAAVSCOM-TR-75-42
Contract DAAJ01-74-C-1017

Descriptors: *Helicopters, *Critical assemblies, Malfunctions, Failure(Mechanics), Structural members, Quality assurance, Quality control, Spare parts, Logistics.
Identifiers: H-1 aircraft, UH-1H aircraft, AH-1G aircraft, Huey Cobra, H-6 aircraft, OH-6A aircraft, H-58 aircraft, OH-58A aircraft, H-47 aircraft, CH-47 aircraft, H-54 aircraft, CH-54 aircraft, *Failure analysis.

A three-phase Critical Parts Program on the UH-1H, AH-1G, OH-6A, OH-58A, CH-47, and CH-54 aircraft, was implemented to: identify parts that had malfunctioned and subsequently caused a flight abort, identify the mode of failure with regard to the identified items, and determine those characteristics of a part that should be closely controlled during manufacture. Of all six aircraft, during specific time periods, the greatest problem areas lie in the engine and transmission systems. The chip detector reports indicate that the chip detectors are functioning properly about 50 percent of the time. Also, less than 16.5 percent of the parts subjected for analysis at CCAD could be identified to an accident report, for each type of aircraft.

AD-A016 278/4GA PC$10.00/MF$2.25
Douglas Aircraft Co Long Beach Calif
Aircraft Noise Definition. Phase I. Analysis of Existing Data for the DC-8, DC-9 and DC-10 Aircraft.
Final rept. Oct 72-Aug 73,
J. S. Goodman. Aug 73, 373p Rept no. MDC-J5973 FAA-EQ-73-5
Contract DOT-FA73WA-3161

Descriptors: *Commercial aircraft, *Jet aircraft, *Aircraft noise, Aerodynamic noise, Jet engine noise, Flight paths, Flyby, Acoustics, Computer programs, Approach, Glide slope.
Identifiers: DC-8 aircraft, DC-9 aircraft, DC-10 aircraft, T-3 engines, JT3D engines, T-8 engines, JT8D-7 engines, JT8D-9 engines, *Noise levels, DOT/4DZ/DA.

The efforts in this phase of the 'Aircraft Noise Definition' project was comprised of processing and analysis of existing acoustic and performance data and preparing acoustic and performance (based on average engine) graphical and computer presentations for two JT3D turbofan-powered DC-8s, one with short and one with long fan ducts; two DC-9s, one with JT8D-7 and one with JT8D-9 engines; and the DC-10-10 and DC-10-40 aircraft. The acoustic data included reference-day EPNL and peak A-weighted sound level curves with empirically developed curves for adjusting the noise levels to temperatures from 30F to 100F with the relative humidity held constant at 70 percent. The performance data include provisions for a temperature variation from 30F to 100F and runway altitude from sea level to 6000 feet. Data accuracy is described in terms of assignable confidence limits.

N75-30145/7GA PC$8.50/MF$2.25
Boeing Vertol Co., Philadelphia, Pa.
Conceptual Design Study of a 1985 Commercial STOL Tilt Rotor Transport.
C. A. Widdison, J. P. Magee, and H. R. Alexander. Nov 74, 256p NASA-CR-137601, D210-10873-1
Contract NAS2-8048

Descriptors: *Helicopter design, *Short takeoff aircraft, *Tilting rotors, *Transport aircraft, Cost effectiveness, Energy conservation, Helicopter performance, Noise reduction, Vertical takeoff aircraft.

For abstract, see STAR 1321

N75-30146/5GA PC$11.50/MF$2.25
Boeing Vertol Co., Philadelphia, Pa.
Conceptual Design Studies of 1985 Commercial VTOL Transports That Utilized Rotors, Volume 1.
J. P. Magee, R. Clark, and H. R. Alexander. Nov 74, 459p NASA-CR-137599, D210-10858-1
Contract NAS2-8048

Descriptors: *Helicopter design, *Rotary wing aircraft, *Transport aircraft, *Vertical takeoff aircraft, Cost effectiveness, Energy conservation, Helicopter performance, Noise reduction, Tandem rotor helicopters.

For abstract, see STAR 1321

N75-30147/3GA PC$10.50/MF$2.25
Boeing Vertol Co., Philadelphia, Pa.
Conceptual Design Studies of 1985 Commercial VTOL Transports That Utilized Rotors, Volume 2.
J. P. Magee, R. Clark, and H. Alexander. Nov 74, 407p NASA-CR-137600, D210-10858-2
Contract NAS2-8048

Descriptors: *Helicopter design, *Rotary wing aircraft, *Transport aircraft, *Vertical takeoff aircraft, Cost effectiveness, Energy conservation, Helicopter performance, Noise reduction, Tandem rotor helicopters.

For abstract, see STAR 1321

N75-30189/5GA PC$3.75/MF$2.25
Stanford Research Inst., Menlo Park, Calif. Information Sciences Lab.
Aircraft Digital Control Design Methods.
Monthly Progress Report.
M. G. Tashker, and J. D. Powell. Jun 75, 36p NASA-CR-143321, MPR-6
Grant NSG-1137

Descriptors: *Aircraft structures, *Digital techniques, *Structural design criteria, Automatic pilots, Boeing 737 aircraft, Control equipment, Motion stability, Numerical analysis.

For abstract, see STAR 1321

N75-30265/3GA PC$3.75/MF$2.25
Carborundum Co., Niagara Falls, N.Y. Research and Development Div.
Thermal/Acoustical Aircraft Insulation Material.
Final Technical Report.
E. Struzik, R. Kunz, and R. Lin. May 75, 37p NASA-CR-144414
Contract NAS9-14482

Descriptors: *Acoustic properties, *Aircraft, *Insulation, *Thermodynamic properties, Fibers, Foams, Materials tests, Physical properties.

For abstract, see STAR 1321

N75-30596/1GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
An Improved Method for Optimum Design of Mechanically and Thermally Loaded Structures.
H. M. Adelman, J. L. Walsh, and R. Narayanaswami. Aug 75, 35p NASA-TN-D-7965, L-10161

Descriptors: *Aircraft structures, *Design analysis, *Mechanical properties, *Optimization, *Thermal stresses, Algorithms, Stress analysis, Structural design criteria, Taylor series, Wings.

For abstract, see STAR 1321

PAT-APPL-487 481/GA PC$3.25/MF$2.25
Department of the Navy Washington D C

Quiet Shrouded Circulation Control Propeller.
Patent Application,
Robert M. Williams. Filed 11 Jul 74, 19p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Helicopters, *Rotor blades, Patents, Aerodynamic slots, Aspect ratio, Trailing edges, Aerodynamics.
Identifiers: PAT-CL-416-20, *Patent applications.

The patent application describes a propeller capable of generating high thrust at reduced noise levels, weight and drag. The propeller blades employ a tangential slot along the trailing edge of each propeller blade and circulation control blowing from the tangential slot over the trailing edge. Lift is generated by the coanda blowing. The lift is proportional to the momentum flow of the air out of the slot and is substantially independent of the rotational velocity. Additionally a circulation control shroud expands the thrusting slipstream of the propeller so that the shroud diffusion angle is increased and the average exit velocity is reduced, thereby increasing efficiency and reducing noise.

1D. Aircraft Flight Control and Instrumentation

N75-30158/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A G-Load Display for Remotely Piloted Vehicles and Other Aircraft That Are Subject to Maneuvering Constraints.
J. C. Howard. Sep 75, 16p NASA-TN-D-8056, A-6032

Descriptors: *Acceleration (Physics), *Maneuverability, *Remote control, Angular velocity, Display devices, Structural design.

For abstract, see STAR 1321

2. AGRICULTURE

2C. Agricultural Engineering

N75-30615/9GA PC$7.00/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Proceedings of the 1974 Lyndon B. Johnson Space Center Wheat-Yield Conference.
D. E. Pitts, and G. L. Barger. Apr 75, 187p NASA-TM-X-58158, JSC-09256
Conf-Conf. Held at Houston, Tex., 1974.

Descriptors: *Conferences, *Crop growth, *Forecasting, *Wheat, Landsat satellites, Meteorological instruments, Remote sensors, Weather.

For abstract, see STAR 1321

PB-244 760/5GA PC$3.75/MF$2.25
Alabama Agricultural Experiment Station, Auburn.
Scheduling and Application Rates of Irrigation in Humid Climate,
C. D. Busch, and E. W. Rochester. Jun 75, 39p Bull 470 W75-11048, OWRT-A-025-ALA(3)

Descriptors: *Irrigation, *Humidity, *Arid land, Weather forecasting, Scheduling, Mathematical models, Soil water, Probability theory, Cotton plants, Production, Rainfall, Field tests, Computer programs, Alabama.
Identifiers: Water demand, Water utilization.

A four-year study of two irrigation scheduling methods and application rates was conducted to determine more efficient uses of supplemental water in a humid climate. One model based the decision to irrigate on weather forecast and soil moisture conditions; the other, irrigation by demand, based on soil moisture conditions only. Two application rates of 0.13 in/hr (low) and 0.43 or 0.7 in/hr (high) were used. A computer program was developed to calculate soil moisture and predict irrigation needs in the forecast scheduling model. A 0.5 probability of rainfall greater than 0.5 inch was the lower limit. The weather forecast also provided the basis of deciding how much rainfall would be included in the soil moisture balance. The method of irrigation by demand improved production 160 lbs. of seed cotton per acre for each inch of water applied. Simulation studies following the field experiment supported the results of the field study.

2F. Forestry

N75-30767/8GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
The Introduction of Mycorrhizal Fungi into Forested Areas of Veronezh Region (Oblast).
V. Y. Chastukhin. Jul 75, 22p NASA-TT-F-16481
Contract NASW-2483
Tran-Transl. Into English from TR. Kompleksnoy Vauchnoy Ekspeditsii Po Voprosam Dolozashchitnogo Lesorazvedeniya (Ussr), V. 2, Issue 2, 1952 p 136-146.

Descriptors: *Forests, *Fungi, *Plants (Botany), *Timber vigor, Deciduous trees, Plant roots, U.s.s.r..
Identifiers: Translations.

For abstract, see STAR 1321

PB-245 258/9GA PC$3.75/MF$2.25
Mississippi Univ., University. Dept. of Geology and Geological Engineering.
Relative Throughfall Enrichment by Biologic and by Aerosol-Derived Materials in Loblolly Pines.
Completion rept.,
Konrad J. Banaszak. Aug 75, 32p W75-11853, OWRT-A-083-MISS(1)
Prepared in cooperation with Mississippi State Univ., Mississippi State. Water Resources Research Inst.

Descriptors: *Pine trees, *Nutrients, *Aerosols, Micrometeorology, Rainfall, Density(Mass/volume), Field tests, Water flow, Tables(Data), Plant tissues, Potassium, pH, Mississippi.
Identifiers: Pinus taeda, Tree canopies.

The objective was to provide an estimate of the relative importance of nutrient enrichment from two sources, biologic materials and aerosols, associated with rain falling through a pine canopy. A plot of loblolly pines was divided into one half that was left as it was and the other half that was enclosed in an attempt to isolate it from aerosols. Rain water and water from the throughfall and stemflow of the trees were analyzed for silica, phosphate, ammonium, sulfate, nitrate, pH, alkalinity, potassium, sodium, and calcium. It appears that there is little difference in enrichment factors from the enclosed versus the open trees, that the contribution of aerosol material to the dissolved load of throughfall is minimal. There also appears to be no net loss of constituents from the canopy of young, growing loblolly pines in very dense stands except for potassium.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-A015 957/4GA PC$5.75/MF$2.25
Naval Academy Annapolis Md
Observation and Solution of the Light Curve for a W Ursae Majoris Eclipsing Binary Star System.
Research rept.,
Bruce E. Miller. 23 May 75, 130p Rept no. USNA-TSPR-70
Report on a Trident Scholar Project.

Descriptors: *Binary stars, Brightness, Intensity, Luminescence, Computer programs, Computations, Tables(Data).
Identifiers: *VW Bootis Binary Stars.

This project has approached the study of eclipsing binary star systems from both the observational and the theoretical stand points. Observations of eclipsing binary stars U Pegasi and AZ Virginis of the W Ursae Majoris contact binary type have been made. The method for solving an eclipsing binary system's light curve for the system's elements (the radii, luminosity and limb darkening coefficients of the component stars and the inclination of the orbital plane) - originally developed by Thomas B. Horak - has been programmed for an electronic computer. Details and proceedings are described. After some modification, Horak's method for solving the light curve is shown to be at least as accurate as the classical methods and yet vastly superior to previous approaches in the speed and ease with which a solution may be obtained. A solution for the recently observed binary system VW Bootis is also obtained which appears superior to the only previous solution. (Author)

3B. Astrophysics

CEA-CONF-3076 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
Diffuse gamma Ray Measurement Above 20 Mev with a Balloon Borne Experiment.
B. Parlier, M. Forichon, T. Montmerle, B. Agrinier, and G. Boella. 1975, 6p CONF-750805-3
U.S. Sales Only.

Descriptors: (*Gamma radiation, Secondary cosmic radiation), (*Secondary cosmic radiation, *Cosmic ray flux), Earth atmosphere, Energy spectra, Pressure dependence.

For abstract, see NSA 32 08, number 20489.

CEA-CONF-3077 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
Synchrotron Radiation, High Energy gamma Rays, and the Distribution of Galactic Cosmic Rays.
J. Paul, M. Casse, and C. J. Cesarsky. 1975, 6p CONF-750805-5
U.S. Sales Only.

Descriptors: (*Milky way, *Gamma radiation), Cosmic gamma sources, Cosmic photons, Emission spectra, Energy spectra, Magnetic fields, Primary cosmic radiation, Structural models, Synchrotron radiation, Wave propagation.

For abstract, see NSA 32 08, number 20490.

COM-75-50193-372-1/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.

Solar-Geophysical Data Number 372. Part I (Prompt Reports). Data for July 1975-June 1975. Explanation of Data Reports Issued as Number 366 (Supplement) February 1975,
Hope I. Leighton. Aug 75, 114p SGD-372-Pt-1
NOAA-75090806
See also COM-75-50193-372-2.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.40/copy for either part; $1.30 for extra issue.

Descriptors: *Solar activity, Solar flares, Solar radio emissions, Solar wind, Sunspots, Solar cosmic rays, Sudden ionospheric disturbances, Geomagnetism, Magnetic storms, Indexes(Documentation), Graphs(Charts), Statistical data, Scientific satellites.
Identifiers: Pioneer 9 spacecraft, SMS-1 GOES satellite.

This is Part 1 (Prompt reports) of Solar-Geophysical Data for July 1975 and June 1975. The July 1975 Data includes sections on Alert Period, Daily Solar Indices, Solar Flares, Solar Radio Waves, Solar Wind Measurements, Spacecraft Observations, Solar X-ray Radiation, and Inferred IP Magnetic Field Polarities. The June 1975 Data includes sections on Daily Solar Activity Centers, Sudden Ionospheric Distrubances, Solar Radio Waves, Cosmic Waves, Geomagnetic Indices, and Radio Propagation Indices.

COM-75-50193-372-2/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 372. Part II (Comprehensive Reports). Data for February 1975-January 1975 and Miscellanea. Explanation of Data Reports Issued as Number 366 (Supplement) February 1975,
Hope I. Leighton. Aug 75, 27p SGD-372-Pt-2
NOAA-75090807
See also COM-75-50193-372-1.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28891. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.40/copy for either part; $1.30 for extra issue.

Descriptors: *Solar activity, Solar flares, Solar radio emission, Geomagnetism, Indexes(Documentation), Graphs(Charts), Statistical data, Scientific satellites.
Identifiers: OSO-5 satellite.

The February 1975 data includes sections on Solar Flares and Solar Radio Waves. The January 1975 data includes sections on Abbreviated Calendar Record, and Regional Flare Index. Miscellaneous data includes sections on Daily Solar Activity Centers, and Geomagnetic Indices.

COO-3071-113 PC$5.00/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Physics.
Neutrino Astrophysics.
S. A. Bludman. 17 Jan 75, 36p CONF-741215-3, UPR-0036T

Descriptors: (*Neutron stars, *Emission spectra), Antineutrinos, Emission, Galaxy clusters, Intergalactic space, Luminosity, Neutrinos, Photon emission, Relativistic range, Star evolution, Statistics.

For abstract, see NSA 32 08, number 20510.

JPRS-65778 PC$5.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Space Research Conducted in the USSR in 1974 COSPAR Report, 18th Plenary Session.
29 Sep 75, 129p
Trans. of mono. Kosmicheskie Issledovaniya, Vypolnennye v SSSR v, 1974, Godu Doklad Kospar, Vosemnadtsatyi Plenum, Moscow, 1975 p1-112.

Descriptors: *Space exploration, Lunar probes, Mars probes, Cosmic rays, Interplanetary medium, Magnetosphere, Earth atmosphere, Upper atmosphere, Manned space flight, Aerospace medicine, Spacecraft launching, USSR, Translations, Research.

The report contains a review of the exploration and use of outer space for scientific and national economic goals conducted in the USSR in 1974. Topics discussed include: Investigations of the moon and planets; Investigations of cosmic rays, interplanetary medium and earth's magnetosphere; Investigations of physics of the upper atmosphere and meteorological investigations; Manned space flights; Biomedical research; Exoatmospheric astronomy; International cooperation; Launchings of space vehicles in the USSR in 1974.

LA-UR-75-1038 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Particle Acceleration Near an Accreting Black Hole.
S. Ames. Aug 75, 5p CONF-750805-6
Contract W-7405-ENG-36

Descriptors: (*Black holes, *Pair production), Acceleration, Angular distribution, Electromagnetic fields, Energy spectra, Kerr metric, Rotation, Time dependence.

For abstract, see NSA 32 08, number 20519.

LA-UR-75-1122 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Model Cosmic gamma-Ray Burst.
I. B. Strong, R. W. Klebesadel, and W. D. Evans. 1975, 4p CONF-750805-7
Contract W-7405-ENG-36

Descriptors: (*Cosmic gamma bursts, *Data compilation), Cosmic gamma sources, Cosmic radiation, Gamma radiation, Mathematical models.

For abstract, see NSA 32 08, number 20492.

LA-UR-75-1123 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Gamma-Ray Bursts from Black Hole Accretion Disks.
I. B. Strong. 1975, 7p CONF-750805-1
Contract W-7405-ENG-36

Descriptors: (*Black holes, *Gamma radiation), Coordinates, Cosmic gamma bursts, Cosmic gamma sources, Kev range 01-10, Kev range 10-100, Mathematical models, Origin, Star accretion.

For abstract, see NSA 32 08, number 20493.

NP-20421 PC$8.25/MF$2.25
Niels Bohr Institutet, Copenhagen (Denmark).
Equation of State at Ultra High Densities. Part II.
V. Canuto. 1974, 103p
U.S. Sales Only.

Descriptors: (*Nuclear matter, *Equations of state), (*Neutron stars, Equations of state), Density, Hydrodynamics, Hyperons, Lagrangian function, Liquids, Many-body problem, Proton-proton interactions, Relativistic range, Solidification, Sound waves.

For abstract, see NSA 32 08, number 20522.

N75-30953/4GA PC$3.25/MF$2.25
Cornell Univ., Ithaca, N.Y.
Detection of the (OIII)88.16MU Line in M17.
D. B. Ward, G. Gull, and M. Harwit. 1975, 9p
NASA-CR-143366
Contract NGR-33-010-146

Descriptors: *Far infrared radiation, *Interstellar matter, *Line spectra, Fine structure, Radio sources (Astronomy).

For abstract, see STAR 1321

N75-30954/2GA PC$3.75/MF$2.25
Hale Observatories, Pasadena, Calif.
Optical and Infrared Spectrophotometry of 18 Markarian Galaxies.
E. E. Becklin, G. Neugebauer, J. B. Oke, and L. Searle. 1975, 47p NASA-CR-143379
Contracts NGL-05-002-207, NGL-05-002-134
Subm-Prepared in Cooperation with Calif. Inst. Of Technol., Pasadena and Carnegie Inst. Of Washington, Pasadena, Calif.

Descriptors: *Galaxies, *Infrared spectrophotometers, *Stellar spectrophotometry, Emission spectra, H lines, Monochromators, Stellar spectra, Ultraviolet radiation.

For abstract, see STAR 1321

N75-30955/9GA PC$5.75/MF$2.25
Systems Research Lab., Champaign, Ill.
Research Study on Stabilization and Control. Modern Sampled-Data Control Theory: Stability Analysis of the Low Cost Large Space Telescope System.
Final Report.
B. C. Kuo, and G. Singh. 30 Jun 75, 129p NASA-CR-143933
Contract NAS8-29853

Descriptors: *Control theory, *Large space telescope, *Pointing control systems, *Stabilization, Analog to digital converters, Cost analysis, Digital to analog converters, Error analysis, Feedback control, Friction factor.

For abstract, see STAR 1321

N75-30956/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Astrometric Binary mu Cas: Photographically Almost Resolved, and Its Implications on the Primordial Helium Abundance.
W. A. Feibelman. Jul 75, 17p NASA-TM-X-70950, X-673-75-182

Descriptors: *Astronomical photography, *Binary stars, *Helium, *Stellar mass, Astronomical models, Astronomical observatories, Cassiopeia constellation, Cosmology.

For abstract, see STAR 1321

N75-30957/5GA PC$5.75/MF$2.25
European Space Research Organization, Paris (France).
Space Astrometry.
T. D. Nguyen, and B. T. Battrick. Mar 75, 147p
ESRO-SP-108
Conf-Proc. Of a Symp. Held at Frascati, Italy, 22-23 Oct. 1974.
Partly in English and Partly in French.

Descriptors: *Astrometry, *Celestial reference systems, *Spaceborne telescopes, Astronomical catalogs, Earth rotation, Earth-moon system, Optical equipment, Parallax, Spacelab, Td satellites.

For abstract, see STAR 1321

N75-30977/3GA PC$4.25/MF$2.25
Ministero degli Affari Esteri, Rome (Italy).
Problems on the Origin and Evolution of the Solar Systems Problemi Sull'Origine E l'Evoluzione Del Sistema Solare.
A. Coradini, and C. Federico. 1975, 74p
In Italian; Partly in English.

Descriptors: *Planetary evolution, *Solar system, Magnetic fields, Mars (Planet), Mercury (Planet), Planetary atmospheres, Solar wind.

For abstract, see STAR 1321

N75-30979/9GA PC$3.25/MF$2.25
Rice Univ., Houston, Tex. Dept. of Space Physics and Astronomy.
Spectral Line Profiles for a Planetary Corona.
J. W. Chamberlain. 1975, 16p NASA-CR-143320
Grant NSG-7043, Contract NSF GA-41788

Descriptors: *Balmer series, *Coronas, *Lyman spectra, Numerical analysis, Satellite orbits, Spectral resolution.

For abstract, see STAR 1321

N75-30980/7GA PC$7.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Particle Motion in Atmospheric Boundary Layers of MARS and Earth.
B. R. White, J. D. Iversen, R. Greeley, and J. B. Pollack. Aug 75, 208p NASA-TM-X-62463, A-6210

Descriptors: *Atmospheric boundary layer, *Mars atmosphere, *Particle motion, Atmospheric models, Equations of motion, Numerical analysis, Particle trajectories, Turbulent boundary layer, Wind effects.

For abstract, see STAR 1321

N75-30981/5GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Earth and Planetary Sciences.
Some Aspects of Core Formation in Mercury.
S. C. Solomon. Jun 75, 38p NASA-CR-143322
Grant NSG-7081
Subm-Submitted for Publication. Conf-Presented at 1ST Intern. Colloq. On Mercury, Jun. 1975.

Descriptors: *Cores, *Mercury (Planet), *Planetology, Geology, Models, Planetary magnetic fields, Temperature effects.

For abstract, see STAR 1321

N75-30982/3GA PC$4.25/MF$2.25
Ohio State Univ. Research Foundation, Columbus.
Contribution of APOLLO Lunar Photography to the Establishment of Selenodetic Control.
Final Report.
A. Dermanis. May 75, 74p NASA-CR-144408, DGS-226
Contracts NAS9-13093, OSURF PROJ. 3487-A1

Descriptors: *Apollo project, *Lunar photography, *Selenography, Data acquisition, Geodetic coordinates, Lunar orbits, Maximum likelihood estimates, Statistical analysis.

For abstract, see STAR 1321

N75-30983/1GA PC$4.25/MF$2.25
Lockheed Electronics Co., Houston, Tex.
SI-4 S-190 Spectroradiometric Accuracy.
R. A. Albrizio. Jan 75, 56p NASA-CR-141680, LEC-5315
Contract NAS9-12200

Descriptors: *Accuracy, *Photointerpretation, *Skylab 4, *Spectroradiometers, Photographic film, Spaceborne photography, Tables (Data).

For abstract, see STAR 1321

N75-30984/9GA PC$3.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Comparative Meteorology of Planets.
K. Y. Kondratyev. Jul 75, 49p NASA-TT-F-16441
Tran-Transl. Into English from Gidrometeoizdat (Leningrad), 1975 p 1-48.

Descriptors: *Mars (Planet), *Meteorological parameters, *Planetary atmospheres, *Venus (Planet), Atmospheric circulation, Clouds (Meteorology), Remote sensors, Similarity theorem, Solar system.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30986/4GA PC$3.75/MF$2.25
Hulburt (E. O.) Center for Space Research, Washington, D.C.
Final S020 Skylab Experiment Report.
R. Tousey, and D. L. Garrett. Jul 75, 34p NASA-CR-144380
NASA ORDER T-87988

Descriptors: *Experimental design, *Line spectra, *Skylab program, *Solar activity, *Spectrum analysis, Dynamic characteristics, Spectrographs, Ultraviolet radiation, X rays.

For abstract, see STAR 1321

N75-30987/2GA PC$3.79/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
The Solar Atmosphere and the Structure of Active Regions.
Semiannual Report, 1 Jan. - 30 Jun. 1975.
P. A. Sturrock. Aug 75, 39p NASA-CR-143334, SAR-7
Contract NGL-05-020-272

Descriptors: *Aircraft accidents, *Solar activity effects, *Solar atmosphere, *Weather, Mathematical models, Numerical analysis, Solar flares, Solar physics, Solar x-rays.

For abstract, see STAR 1321

N75-30988/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Total and Spectral Solar Irradiance and Its Possible Variations.
M. P. Thekaekara. Jun 75, 33p NASA-TM-X-70944, X-912-75-155
Conf-Presented at the Solar Constant Workshop, Big Bear Lake Obs., Calif., 19-21 May 1975.

Descriptors: *Solar radiation, *Solar spectra, *Variability, Earth (Planet), Solar energy, Solar flux, Weather.

For abstract, see STAR 1321

N75-30991/4GA PC$3.75/MF$2.25
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
Electron Plasma Oscillations Associated with Type 3 Radio Emissions and Solar Electrons.
Progress Report.
D. A. Gurnett, and L. A. Frank. Jul 75, 42p NASA-CR-143319, U-OF-IOWA-75-25
Contracts NAS5-11074, NAS5-11431
Subm-Submitted for Publication.

Descriptors: *Electron plasma, *Plasma oscillations, *Solar electrons, *Type 3 bursts, Bow waves, Electromagnetic radiation, Explorer 43 satellite, Explorer 50 satellite, Shock waves, Solar flares.

For abstract, see STAR 1321

N75-30992/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Atmospheric X-Ray Emission Experiment for Shuttle.
R. A. Goldberg, K. L. Hallam, and J. G. Emming. Aug 75, 21p NASA-TM-X-70954, X-912-75-189
Conf-Presented at the Proceedings of the 21ST Annual Meeting of the Aas, Denver, Colorado, 26-28 Aug. 1975.

Descriptors: *Earth atmosphere, *Emission, *Experimentation, *Radiation counters, *Space shuttles, *X rays, Auroras, Bremsstrahlung, Electron precipitation, Solar activity effects, Solar instruments, Weather.

For abstract, see STAR 1321

N75-30993/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Interplanetary Acceleration of Energetic Nucleons.
F. B. Mcdonald, B. J. Teegarden, J. H. Trainor, T. T. Von Rosenvinge, and W. R. Webber. Jul 75, 18p NASA-TM-X-70955, X-660-75-192
Subm-Submitted for Publication.

Descriptors: *Nucleons, *Particle acceleration, *Pioneer 10 space probe, *Pioneer 11 space probe, Cosmic rays, Imp, Solar activity.

For abstract, see STAR 1321

UCRL-76755 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
New Model for the Lunar Interior to 250 Km.
A. J. Piwinskii, and A. G. Duba. 7 May 75, 24p
CONF-750344-1

Descriptors: (*Moon, *Structural models), Depth, Lunar materials, Petrology, Rocks.

For abstract, see NSA 32 08, number 20725.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A015 618/2GA PC$4.75/MF$2.25
Naval Research Lab Washington D C
Coupled Barium Cloud-Ionosphere Systems. 4. Striation Penetration into an Inhomogeneous Ionosphere.
Memorandum rept.,
S. R. Goldman, A. J. Scannapieco, L. Baker, and S. L. Ossakow. Jul 75, 78p Rept no. NRL-MR-3083

Descriptors: *Ionosphere, Partial differential equations, Striations, Numerical analysis, Barium.
Identifiers: *Barium clouds, *Chemical release studies, F region.

The present study investigates, via linear theory, how striations (treated as perturbations) created in a plasma cloud, centered at 200 km, will penetrate into the background inhomogeneous (real) ionosphere as a function of wavelength, integrated Pedersen conductivity ratio of the cloud to ionosphere, and ambient ionospheric conditions. The study is posed as

an eigenvalue problem which while determining the potential variaton (eigenmode) along magnetic field lines, self-consistently solves for the growth rate (eigenvalue) in the coupled cloud-inhomogeneous ionospheric system.

AD-A015 672/9GA PC$3.75/MF$2.25
California Univ Riverside Inst of Geophysics and Planetary Physics
Upper Limits to the Quiet-Time Solar Neutron Flux from 10 to 100 MeV.
Technical rept.,
Shin Moon, George M. Simnett, and R. Stephen White. 23 Jun 75, 31p Rept no. IGPP-UCR-75-15
Contract N00014-69-A-0200-5004, Grant NGR-05-008-022

Descriptors: *Solar radiation, *Neutron flux, Limitations, Quiet, Solar energy, Temperate regions, Neutron detectors, Balloons, Neutron scattering, Telescopes, High altitude.

The UCR large area solid-angle double scatter neutron telescope was flown to search for solar neutrons on 3 balloon flights on September 26, 1971, May 14, 1972 and September 19, 1972. The first two flights were launched from Palestine, Texas and the third from Cape Girardeau, Missouri. The float altitude on each flight was at about 5 g/sq cm residual atmosphere. Neutrons from 10 to 100 MeV were measured. No solar flares occurred during the flights. Upper limits to the quiet time solar neutron fluxes at the 95% confidence level are .00028, .00046, .00096 and .00090 neutrons/sq cm-sec in the energy intervals of 10-30, 30-50, 50-100 and 10-100 MeV, respectively. (Author)

AD-A015 673/7GA PC$3.25/MF$2.25
California Univ Riverside Inst of Geophysics and Planetary Physics
A Cosmic Gamma-Ray Burst on May 14, 1975.
Technical rept.,
Dennis Herzo, Bruce Dayton, Allen D. Zych, and R. Stephen White. 21 Aug 75, 17p Rept no. IGPP-UCR-75-16
Contract N00014-69-A-0200-5004, Grant NGR-05-008-022

Descriptors: *Cosmic rays, *Gamma rays, Cosmic ray telescopes, Gamma ray scattering, Balloons, Temperate regions, High altitude, Scintillation counters.
Identifiers: Cosmic ray showers.

A cosmic gamma-ray burst is reported that occurred at 29309.11 s UTC, May 14, 1975. The burst was detected at an atmospheric depth of 4 g/sq cm residual atmosphere with the University of California double scatter gamma-ray telescope launched on a balloon from Palestine, Texas at 1150 UTC, May 13, 1975. The burst was observed both in the single scatter mode by the top liquid scintillator tank in anti-coincidence with the surrounding plastic scintillator and in the double scatter mode from which energy and directional information are obtained. The burst is 24 standard deviations above the background for single scatter events. The total gamma-ray flux in the burst, incident on the atmosphere with photon energy greater than 0.5 MeV, is 0.59 + or - 0.15 photons/sq cm. The initial rise time to 90% of maximum is 0.015 + or - 0.005 s and the duration is 0.11 s. Time structure down to the 5 ms resolution of the telescope is seen. The mean flux over this time period is 5.0 + or - 1.3 photons/sq cm/s and the maximum flux is 8.5 + or - 2.1 photons/sq cm/s.

AD-A015 736/2GA PC$5.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Asymptotic Directions and Vertical Cutoff Rigidities for Selected Cosmic-Ray Stations as Calculated Using the International Geomagnetic Reference Field Model Appropriate for Epoch 1975.0.
Environmental research papers,
M. A. Shea, and D. F. Smart. 5 May 75, 107p
Rept nos. AFCRL-ERP-510, AFCRL-TR-75-0247

Descriptors: *Cosmic rays, *Geomagnetism, *Particle trajectories, Directional, Tables(Data), Earth models, Sources, Vertical orientation, Latitude, Longitude, Magnetic fields, Interplanetary space, Ground stations, Grids(Coordinates), Analytic geometry, Computer applications.
Identifiers: Penumbra, Asymptotic analysis.

Tables of asymptotic directions and vertical cutoff rigidities for a selected set of cosmic-ray stations are presented. These values were obtained by the integration of vertically incident cosmic-ray trajectories through the International Geomagnetic Reference Field model adjusted for a 1975.0 Epoch. The table of asymptotic directions contains the asymptotic latitudes and longitudes that specify the direction of approach from interplanetary space of a cosmic-ray particle. These asymptotic directions are given for specific rigidities above the main cone cutoff rigidity for each station, and at 0.01 GV rigidity intervals throughout the penumbra. Maps of the asymptotic directions for each station are also included. The table of vertical cutoff rigidities contains the geographic coordinates and L value of each cosmic-ray station together with the main cone cutoff rigidity, the Stormer cutoff rigidity, and the effective cutoff rigidity. (Author)

AD-A015 739/6GA PC$6.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Tables of Asymptotic Directions and Vertical Cutoff Rigidities for a Five Degree by Fifteen Degree World Grid as Calculated Using the International Geomagnetic Reference Field for Epoch 1965.0.
Environmental research papers,
M. A. Shea, and D. F. Smart. 17 Jul 75, 165p
Rept nos. AFCRL-ERP-524, AFCRL-TR-75-0381

Descriptors: *Cosmic rays, *Geomagnetism, *Particle trajectories, Directional, Tables(Data), Earth models, Sources, Vertical orientation, Latitude, Longitude, Magnetic fields, Interplanetary space, Ground stations, Grids(Coordinates), Analytic geometry, Computer applications.
Identifiers: Asymptotic analysis.

Tables of asymptotic directions and vertical cutoff rigidities for a five degree by fifteen degree world grid are presented in this report. These values were obtained by the integration of vertically incident cosmic-ray trajectories through the International Geomagnetic Reference Field for Epoch 1965.0. The table of asymptotic directions contains the asymptotic latitudes and longitudes which specify the direction of approach, from interplanetary space, of a cosmic-ray particle. These asymptotic directions are given for each grid point for specific rigidities above the main cone cutoff rigidity. The table of vertical cutoff rigidities contains the geographic coordinates and L value of each location together with the main cone cutoff rigidity, the Stormer cutoff rigidity, and the effective cutoff rigidity. (Author)

AD-A015 797/4GA PC$4.25/MF$2.25
Utah State Univ Logan Center for Research in Aeronomy
Studies of Disturbed Ionospheres.
Final scientific rept. 1 Apr 72-1 Apr 75,
Kay D. Baker. Jun 75, 64p AFCRL-TR-75-0342
Contract F19628-72-C-0255

Descriptors: *Ionospheric disturbances, Aurorae, Polar cap absorption, *Airglow, Emission spectra, Visible spectra, Ultraviolet spectra, Infrared spectra.

Research was directed toward the investigation of disturbed ionospheres. The research primarily used rocketborne payloads instrumented to measure such ionospheric parameters as energetic particle fluxes, atmospheric emissions (ultraviolet, visible, and infrared), particle densities and composition. In many instances the rocketborne, in-situ measurements were supplemented by remote measurements from ground based instruments. Emphasis during the contractual period has been on development of both instrumentation and techniques for accomplishing the measurements as well as on obtaining the accumulated measurements themselves. Multiple programs during the 3-year period have allowed for the investigation of diverse phenomena, including PCA (polar cap absorption), AZA (Auroral Zone Absorption), auroral phenomena, and Polar Airglow. Additionally a laboratory testing program provided the initial oportunity to examine the capabilities of instruments for measuring particle densities within the confines of a controlled laboratory environment.

AD-A015 798/2GA PC$3.25/MF$2.25
Panametrics Inc Waltham Mass
An Electrostatic Analyzer for an Air Force Satellite Payload,
Paul R. Morel, Frederick A. Hanser, and Bach Sellers. Jul 75, 12, Rept no. Scientific-2
AFCRL-TR-75-0366
Contract F19628-73-C-0019

Descriptors: *Aurorae, *Polar cap, *Electrostatic analyzers, Electron probes, Spectrum analyzers, Electron energy, Scientific satellites.

A satellite-borne electron spectrum analyzer has been developed. This instrument performs a 32 channel differential analysis of 0.08 to 17 keV electrons, via electrostatic deflection. The described instrument is a modified version of units successfully launched into auroral breakups at Ft. Churchill, Manitoba, Canada. The modified design minimizes weight and power requirements, and provides an interface compatible with certain Air Force small satellites. Two instruments have been fabricated, tested and calibrated. One has been integrated into an Air Force Small satellite, scheduled for launch in 1975. The second instrument undergoes periodic checks and is maintained as a backup unit to the flight unit.

AD-A015 812/1GA PC$7.00/MF$2.25
Radiation Research Associates Inc Fort Worth Tex
Sky Radiance Calculations in the 0.5 micrometer - 5.0 micrometer Wavelength Range.
Final rept. 1 Feb 74-30 Apr 75,
Wolfram G. M. Blattner, and Michael B. Wells. 31 May 75, 188p Rept no. RRA-T7501 AFCRL-TR-75-0317
Contract F19628-74-C-0140

Descriptors: *Sky brightness, *Aerosols, *Air pollution, Atmospheric scattering, Infrared spectra, Light transmission, Mathematical models, Tables(Data), Atmosphere models.
Identifiers: Flash computer program, Atmospheric attenuation, *Atmospheric emission, Radiative transfer.

The FLASH Monte Carlo code was modified in order to allow for the atmospheric emission and for the emission by the surface of the earth. The modification includes the consideration of the newest absorption data available. The FLASH program was then used for calculations of the radiances obtained for air-borne detectors at 120, 200, and 35,800 km altitudes.

AD-A015 858/4GA PC$3.75/MF$2.25
Northeastern Univ Boston Mass
Nuclear Burst Induced Shock Wave Modeling of Energetic Electron Injection into the Magnetosphere: Application of Streaming Plasma Instabilities to Shock Structures.
Scientific rept. no. 1, 1 Jul 74-30 Jun 76,
John W. Cipolla, Kenneth I. Golden, and Michael B. Silevitch. 15 Jul 75, 35p AFCRL-TR-75-0405
Contract F19628-75-C-0012

Descriptors: *Magnetosphere, *Whistlers, *Nuclear explosions, *Electron emission, Shock waves, Nuclear fireball, Van Allen radiation belt, Dispersion relations.
Identifiers: Plasma instabilities.

A parallel shock wave structure is modeled as a region of interpenetrating streams of cold unshocked and hot shocked ions. The linear dispersion theory predicts that unstable whistlers can stand and therefore grow to large amplitude at the leading edge of weak and intermediate strength shocks. Magnetosonic instabilities and their role in the structure of perpendicular shock waves were also studied. Since these instabilities are not stationary in the shock layer, they cannot play a principal role in the structure.

AD-A015 923/6GA PC$3.75/MF$2.25
General Electric Co Santa Barbara Calif Dasiac
Reaction Rate Data. Number 52.
Jul 75, 26p
Contract DNA001-74-C-0014
See also report dated Apr 75, AD-A014 327.

Descriptors: *Atmospheric chemistry, *Aeronomy, *Reaction kinetics, Upper atmosphere, Particle collisions, Nitrogen oxides, Gas ionization, Abstracts, Atoms, Electrons, Scientific research, Charge transfer, Thermochemistry, Energy transfer, Ions.
Identifiers: Metal oxides, Reaction rates, Recombination reactions.

Summaries of research on atmospheric chemistry and physics are presented. Reaction kinetics, atomic and molecular physical processes, and thermochemistry related to the upper atmosphere are included.

AD-A015 937/6GA PC$5.25/MF$2.25
Washington Univ Seattle Dept of Atmospheric Sciences
Airborne Measurements and Observations in Cirrus Clouds.
Interim rept.,
Peter V. Hobbs, Lawrence F. Radke, and Donald G. Atkinson. 13 Jan 75, 114p Rept no. Scientific-1 AFCRL-TR-75-0249
Contract F19628-74-C-0066

Descriptors: *Cirrus clouds, *Ice formation, Meteorological satellites, Spaceborne, Particle size, Infrared photography, Concentration(Composition), Atmospheric temperature, Visible spectra, Flight paths, Tables(Data).
Identifiers: Spaceborne photography.

Fourteen case studies of airborne measurements in cirrus clouds are described. For each case information is given on the location of the flight, the synoptic situation (with accompanying satellite IR and visible photographs), the types, sizes and mass concentrations of ice particles in the clouds, and the distribution of the ice mass concentration among particle sizes at different altitudes. From simultaneous measurements of ice mass concentrations and ice particle number concentrations, mean ice particle masses are derived: They range from about 0.3 to 30 micrograms. Low number concentrations of ice particles are generally associated with low ice mass concentrations and high number concentrations with high mass concentrations. The total ice mass concentrations in cirrus clouds generally increase with increasing temperature. Maximum values of the total ice mass concentration did not exceed the atmospheric water vapor content for water saturated conditions (about 0.1 and 1.0 g/cubic meter at -45 and -20C respectively) except when the cirrus originated from cumulonimbus tops.

AD-A015 959/0GA PC$5.25/MF$2.25
Naval Academy Annapolis Md
The Zenith-Angle Distribution of Stopping Muons at Sea Level, and the Response of a Stopping Muon Cosmic-Ray Detector.
Research rept.,
Gordon N. Roesler, Jr. 22 May 75, 101p Rept no. USNA-TSPR-72
Report on a Trident Scholar Project.

Descriptors: *Muons, *Cosmic ray telescopes, Cosmic rays, Sea level, Mathematical models, Angles, Computer programs, Least squares method, Computations, Detectors, Tables(Data).
Identifiers: *Muon telescopes.

The Zenith-angle distribution of stopping muons at sea level, and the response of a stopping muon cosmic-ray detector were investigated in this research report. In order to determine the angular response of a wide-angle stopping muon telescope, smaller detectors were placed in coincidence with it which provided a correlation of count rate with zenith-angle of particle arrival. Using numerical integration techniques, computer solutions were employed to predict the zenith-angle-selective count rates for various descriptions of the incident flux. A least-squares analysis yielded a cosine power expressed mathematically. Employing this flux expression in predictive computer programs provided an accurate model of the wide angle telescope response from which the telescope half-angle was determined. Considerations of overburden effects and data corrections are discussed.

AD-A016 061/4GA PC$4.25/MF$2.25
Aerospace Corp El Segundo Calif Lab Operations
Midlatitude E-Region: An Examination of the Existence of a Corpuscular Source,
Fred A. Morse, and Carl J. Rice. 26 Aug 75, 54p Rept no. TR-0076(6960-04)-2 SAMSO-TR-75-221
Contract F04701-75-C-0076

Descriptors: *Ionosphere, *Corpuscular radiation, Electron flux, Protons, Energetic properties, Particle flux, Sounding rockets, Atmospheric sounding.
Identifiers: *E region, Astrobee.

This report presents data obtained from two rocket flights launched from White Sands Missile Range to investigate energetic electrons and positive ions in the E-region ionosphere below 120 km. The rocket payload was designed to measure these particles in the energy range 40 eV to 5.5 keV. The purpose of the flights was to investigate the possible role of corpuscular radiation in ionospheric E-region processes and as a source of heating in the lower thermosphere at a mid-latitude location.

AD-A016 175/2GA PC$3.75/MF$2.25
Johns Hopkins Univ Laurel Md Applied Physics Lab
The Amplitude Distribution of Field-Aligned Currents at Northern High Latitudes Observed by Triad.
Interim rept.,
Takesi Iijima, and Thomas A. Potemra. Aug 75, 36p

Descriptors: *Magnetic disturbances, *Aurorae, Geomagnetism, Electric current, Magnetosphere, Ionosphere, Magnetic fields, Scientific satellites, Variations, Field intensity, Distribution, Sizes(Dimensions), Alaska.
Identifiers: Triad satellite.

The spatial distribution and magnitudes of field-aligned currents at 800 km altitude over northern high latitudes were determined from TRIAD magnetometer data recorded at College, Alaska, during the period from July 1973 to October 1974.

AD-A016 176/0GA PC$3.75/MF$2.25
Johns Hopkins Univ Laurel Md Applied Physics Lab
Net Field-Aligned Currents Observed by Triad.
Interim rept.,
Masahisa Sugiura, and Thomas A. Potemra. Jul 75, 40p
Grant NSF-DES73-00593
Prepared in cooperation with National Aeronautical and Space Administration, Greenbelt, Md. Goodard Space Flight Center.

Descriptors: *Aurorae, *Magnetic disturbances, Geomagnetism, Polar cap, Magnetosphere, Ionosphere, Magnetic fields, Scientific satellites, Electric current, Alaska.
Identifiers: Triad satellite.

In an appreciable fraction of the Triad passes over the northern auroral oval, a step-like level shift is observed in the component approximately in the dipole east-west direction. This implies that there is a net field-aligned current flowing into or away from the ionsophere in a current sheet parallel to an L-shell. This report discusses the results of detailed analysis of these step-like level shifts and an underlying basic pattern of field-aligned current flowing in the polar cap boundary region.

AD-A016 177/8GA PC$3.75/MF$2.25
Johns Hopkins Univ Laurel Md Applied Physics Lab
The Spatial Relationship between the Evening Radar Aurora and Field-Aligned Currents.
Interim rept.,
R. T. Tsunoda, R. I. Presnell, and T. A. Potemra. Aug 75, 44p
Grant NSF-DES73-00593
Prepared in cooperation with Stanford Research Inst., Menlo Park, Calif.

Descriptors: *Aurorae, *Magnetic disturbances, Backscattering, Radar reflections, Spatial distribution, Ionosphere, Alaska.
Identifiers: Triad satellite.

The spatial relationship of the radar aurora to the field-aligned currents observed by virtue of the transverse magnetic disturbances detected by the TRIAD satellite are examined. Using a 398-MHz phased-array radar located at Homer, Alaska, event-by-event comparisons were made between the evening radar aurora and the field-aligned currents in the 1700-to-2100 MLT sector.

AD-A016 179/4GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Ionosphere Research Lab
A Synoptic Study of the Variability of Mesospheric Ionization in Winter.
Final rept. 1 Jul 72-30 Sep 74,
Leslie C. Hale. 1 Sep 75, 12p Rept no. PSU-IRL-FR-75-1 ARO-10287.9-EN, ARO-12400.1-GS
Grants DA-ARO-31-124-72-G158, DAHC04-74-G-0096

Descriptors: *Atmospheric sounding, *Mesosphere, *Atmospheric electricity, *Stratosphere, Sounding rockets, Meteorological balloons, Ionization, Nitrous oxide, Electri-

cal conductivity, Meteorological instruments, Ice, D region.

The research summarized includes a statistical study of the variability of mesospheric ionization in winter, three large stratospheric balloon flights, and a series of winter D-region rocket measurements. Also discussed is a Gerdien condenser measurement which showed widely separated mobility groups of mesospheric ions in the daytime. An explanation of the observed mesospheric ionization variability which involves sub-micron ice particulates has been published.

COO-2195-12 PC$11.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Meteorology.
Density Variations in the Lower Thermosphere. Scientific Report No. 2.
W. F. Johnson. 19 Feb 74, 175p
Contract AT(11-1)-2195

Descriptors: (*Thermosphere, *Density), Computer calculations, Gravity waves, Satellites, Variations.

For abstract, see NSA 32 08, number 20740.

JINR-E9-8315 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
Mechanisms of Energy Transformation at the Formation of Whistler Solitons.
I. L. Bogolubskii, and V. G. Makhankov. 1974, 13p
U.S. Sales Only.

Descriptors: (*Whistlers, *Energy losses), Computer calculations, One-dimensional calculations, Short wave radiation, Solitons.

For abstract, see NSA 32 08, number 20741.

LA-UR-75-791 PC$4.50/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Recent Observations Relating to the Dynamics and Origin of the Magnetotail Plasma Sheet.
E. W. Hones, Jr.. 1975, 28p CONF-750461-1
Contract W-7405-eng-36

Descriptors: (*Magnetotail, *Plasma sheet), Interplanetary magnetic fields, Magnetic storms, Magnetosphere, Solar wind.

For abstract, see NSA 32 08, number 20772.

N75-30698/5GA PC$7.50/MF$2.25
Northrop Services, Inc., Huntsville, Ala.
Kinetic Description of Ionospheric Dynamics in the Three-Fluid Approximation.
R. H. Comfort. Jul 75, 247p NASA-CR-2572
Contract NAS8-21810

Descriptors: *Approximation, *Atmospheric models, *Ionosphere, *Three dimensional flow, Auroral zones, Ionospheric propagation, Magnetohydrodynamic flow, Plasmas (Physics).

For abstract, see STAR 1321

N75-30699/3GA PC$11.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Data for NASA'S AVE 4 Experiment: 25-Mb Sounding Data and Synoptic Charts.
N. F. Fucik, and R. E. Turner. Aug 75, 461p
NASA-TM-X-64952

Descriptors: *Meteorological charts, *Rawinsondes, *Synoptic meteorology, Atmospheric temperature, Climatology, Jet streams (Meteorology), Meteorological parameters, Tables (Data).

For abstract, see STAR 1321

N75-30700/9GA PC$9.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Dust in the Atmosphere and Near-Earth Space.
N. B. Divari. Jul 75, 333p NASA-TT-F-16368
Contract NASW-2481
Tran-Transl. Into English of the Book "Ply V Atmosferi I Okolozemnom Kosmicheskom Prostranstve" Moscow, Nauka Press, 1973 p 1-212.

Descriptors: *Earth atmosphere, *Interplanetary dust, *Terrestrial dust belt, Meteoroids, Micrometeoroids, Photoelectric emission, Upper atmosphere.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30705/8GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
On the Microstructure of the Wind Velocity and Temperature Fields in the Upper Troposphere and Lower Stratosphere.
N. Z. Pinus. Jun 75, 14p NASA-TT-F-16398
Contract NASW-2483
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Fiz. Atmos. Okeana (Ussr), V. 10, Nov. 1974 p 1131-1137.

Descriptors: *Stratosphere, *Temperature distribution, *Troposphere, *Wind velocity, Atmospheric turbulence, Dissipation, Numerical analysis, Reliability analysis.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30994/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Observations of Magnetospheric Ionization Enhancements Using Upper-Hybrid Resonance Noise Band Data from the Rae-1 Satellite.
S. R. Mosier. Aug 75, 19p NASA-TM-X-70945, X-693-75-156
Subm-Submitted for Publication.

Descriptors: *Explorer 38 satellite, *Magnetosphere, *Noise spectra, *Spectral bands, Ionization frequencies, Magnetospheric electron density, Solar corona, Whistlers.

For abstract, see STAR 1321

PAT-APPL-536 077/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Radiosonde Circuitry for Impedance Measurement of an A1203 Absolute Water Vapor Sensor.
Patent Application,
Paul Kranz. Filed 24 Dec 74, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Radiosondes, Patents, Circuits, Detectors, Measurement, Water vapor, Electrical impedance.
Identifiers: *Patent applications, PAT-CL-324-61.

The patent application relates to an improved circuit which permits measurement of the impedance of an Al2O3 water vapor sensor used with conventional radiosonde telemetry systems. The circuit includes an oscillator, an output pulse shaper and a voltage regulator. The oscillator section is a temperature stabilized feedback oscillator which uses the sensor as a feedback element. The oscillator output is a square wave varying from 20 to 200 Hz over the above dew point range, and is stable within plus or minus 1% over a -60C to +20C temperature range. The output pulse shaper converts the square wave from the oscillator to a 60 microsecond wide, 3 volt negative-going pulse suitable for modulating the radiosonde transmitter. The voltage regulator provides regulated +4.5 volts from the sonde battery for operating the oscillator and pulse shaper.

TRITA-EPP-74-14 PC$4.00/MF$2.25
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen foer Plasmafysik.
Electric Field and Plasma Measurements in the Auroral Ionosphere Prior to a Magnetic Substorm.
U. Fahleson, C. G. Faelthammar, and A. Pedersen. Jun 74, 10p
U.S. Sales Only.

Descriptors: (*Ionosphere, *Electric fields), Auroral zones, Electron density, Electron temperature, Langmuir probe, Magnetic storms, Orientation, Plasma, Plasma density.

For abstract, see NSA 32 08, number 20742.

TRITA-EPP-74-25 PC$4.75/MF$2.25
Kungliga Tekniska Hoegskolan, Stockholm (Sweden). Institutionen foer Plasmafysik.
Mechanism for Driving the Gross Birkeland Current Configuration in the Auroral Oval.
G. Rostoker, and R. Bostroem. Dec 74, 34p
U.S. Sales Only.

Descriptors: (*Auroral oval, *Plasma sheet), (*Magnetotail, *Convection), Electric currents, Electric fields, Energy losses, Ionosphere, Magnetic fields, Magnetosphere, Mathematical models, Plasma.

For abstract, see NSA 32 08, number 20773.

WRE-TM-A-247(AP) PC$4.00/MF$2.25
Weapons Research Establishment, Salisbury (Australia).
Comparison of Adcock Bearing Observations on Remote Targets with Local Short Cell Observations of Tid'S.
P. L. George, D. Booth, and A. J. Miller. Mar 74, 14p
U.S. Sales Only.

Descriptors: (*F region, *Travelling ionospheric disturbance), Antennas, Ionosphere, Mhz range 01-100, Simulation, Spectra, Variations.

For abstract, see NSA 32 08, number 20743.

4B. Meteorology

AD-A015 737/0GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Measurement of Cloud Height, Evaluation of Ranging and Triangulation Techniques for Determination of Cloud Height at Airfields.
Final rept.,
Eugene Y. Moroz, and George A. Travers. 29 May 75, 17p Rept nos. AFCRL-AFSG-321, AFCRL-TR-75-0306

Descriptors: *Cloud height indicators, *Optical radar, Ruby lasers, Ceiling, Clouds, Landing fields, Light scattering, Comparison, Triangulation.
Identifiers: Ceilometers, Cloud structure.

A new evaluation of a ruby lidar ceilometer was performed at AFCRL as part of a program to evaluate the applicability of lasers to determine cloud height for airfield use. Comparitive measurements of cloud height were made with a

standard Air Force rotating beam ceilometer (RBC). Examination of the test results shows the lidar indicates an accurate presentation of cloud structure. The RBC cloud return is affected by its geometry and by multiple scatter in the cloud. As a result, the measurement is not a true representation of cloud structure. These effects also bias the RBC to indicate higher cloud heights. However, the difference in cloud heights as measured by the two systems is not significant. Therefore, it is concluded that the lidar is a superior cloud height measuring device and both techniques provide operationally useful indications of cloud height. (Author)

AD-A015 773/5GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
An Objective Evaluator of Techniques for Predicting Severe Weather Events,
Ralph J. Donaldson, Jr., Rosemary M. Dyer, and Michael J. Kraus. 1975, 7p Rept no. AFCRL-TR-75-0507
Availability: Pub. in Conference on Severe Local Storms (9th), Norman, Okla., 21-23 Oct 75, p321-326.

Descriptors: *Storms, *Weather forecasting, Probability, Mathematical prediction, False alarms, Thunderstorms, Tornadoes, Meteorological radar, Hail, Reprints.

Two types of error arise in the prediction of severe weather. The method used may fail to predict the occurrence of a severe weather event, or it may result in a false alarm. Any evaluation of techniques for forecasting severe weather should consider both probability of detection and probability of false alarm. A simple evaluator was used, giving equal weight to probability of detection and false alarms. The Critical Success Index (CSI) is simple the ratio of successful predictions of a critical event to the sum of these successful predictions and the errors of both types. This index may be modified at will to penalize false alarms less than failures to predict severe weather events, or vice versa. Although the CSI can serve as an evaluator of any technique for prediction of critical events, it was applied to various radar methods for identification of severe storms. The results available to date demonstrate a clear superiority of Doppler radar for prediction of tornadoes and damaging windstorms, while reflectivity measured by non-attenuating radar is the most reliable radar technique for identification of hail.

AD-A015 898/0GA PC$7.50/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Dust Storms,
P. S. Zakharov. 7 Apr 75, 230p Rept no. FSTC-HT-23-0377-75
Trans. of mono. Pylnye Buri, Leningrad, 1965 164p.

Descriptors: *Dust storms, Patterns, Agriculture, Meteorological phenomena, Transportation, Distribution, Wind velocity, Particle size, Economics, Control, Winter, Soil erosion, Translations, USSR.

The causes and conditions for formation of dust storms, the basic patterns of their appearance and their effects on agriculture, transportation, irrigation systems, orchards, etc., are given. Geographical distribution of dust storms and wind erosion in the Soviet Union is presented. Specific examples, methods of study and organizational-economic, forest ameliorative and agricultural science methods of control of dust storms are described.

AD-A015 917/8GA PC$3.25/MF$2.25
Hawaii Univ Honolulu Dept of Information and Computer Science
Statistical Meteorology and Time Series Analysis.
Final scientific rept. 29 Sep 72-30 Jun 75,
Richard H. Jones. 1975, 7p AFOSR-TR-75-1290
Grant AF-AFOSR-2405-72

Descriptors: *Weather forecasting, *Statistical analysis, Time series analysis, Estimates, Climate.
Identifiers: Logistic density functions, Autoregressive series.

Techniques are developed for fitting autoregressions to time series data for the purpose of prediction or spectrum estimation with application to meterology.

AD-A015 930/1GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
The Effect of a Rectangular-Scaffold Tower on Extinction Coefficients and Winds Measured in Close Proximity to the Tower.
Instrumentation papers,
Donald A. Chisholm, and Joseph J. Pazniokas. 21 Jul 75, 13p Rept nos. AFCRL-TR-75-0387, AFCRL-IP-236

Descriptors: *Wind velocity, *Towers, Meteorological data, Variations, Measurement, Errors, Visibility, Weather, Tables(Data), Wind direction.
Identifiers: *Wind direction.

An examination of observations of extinction coefficients and winds gathered on opposite sides of a rectangular scaffold tower was conducted to determine to what extent the tower structure altered the prevailing characteristics of the atmospheric parameters. Data were gathered over a two-month period during a wide range of conditions (rain, stratus and fog, and unrestricted periods of visibility) and measurements of the variability of the observations were determined. From these studies, it was found that: (1) The tower structure does not adversely affect the prevailing homogeneity of extinction coefficient, (2) wind speed is retarded by about 10% on the lee side of the tower, and (3) wind direction is more variable on the windward side of the tower.

AD-A016 055/6GA PC$3.75/MF$2.25
Wisconsin Univ Madison Center for Climatic Research
Reconstruction of Past Climatic Proxy Series.
Final rept. 1 Jul 74-30 Jun 75,
John E. Kutzbach. 29 Aug 75, 47p AFOSR-TR-75-1361
Contract F44620-75-C-0055, Grant AF-AFOSR-2407-72

Descriptors: *Climate, Paleontology, Environments, Pollen, Trees, Sediments, History, North America, Northern hemisphere, Graphs, Charts.
Identifiers: *Holocene epoch, *Paleoclimatology, *Paleobotany, Tree ring analysis.

Reconstruction of past climates from pollen data, tree-ring data and historical data is described. The pollen-climate relationships cover the past 10,000 years and deal with North America and portions of Eurasia. Detailed climatic information from 1000-year records of annually laminated lake sediments and tree-ring records in central North America (Great Lakes area) is also described.

AD-A016 093/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Studying Snow Structure,
N. A. Volodicheva, and E. S. Troshkina. 1975, 6p Rept no. FSTC-HT-23-75-68B
Trans. of Akademiia Nauk SSSR. Institut Geografii. Materialy Glyatsiologicheskikh Issledovanii, n12 p149-152 1966.

Descriptors: *Snow, Recrystallization, Atmospheric precipitation, Photographic analysis, Translations, USSR.

In the winters of 1961 - 62 and 1963 - 64 in the territory of the Botanical Garden of the Moscow State University (Lenin Hills), the snow structure was studied. The authors included the observations of the atmospheric precipitation which was falling, and its conversion to a snow layer under the effect of the recrystallization processes. The snowflakes were caught at a height of around 100 m, the photographing was performed with the aid of the camera 'Zenith-S' with the lens Industar-49, which provided a fourfold magnification. The equipment was fastened on a special support of the device for the microphotography, MFA-7 the photographing was done on a film with a sensitivity of 180 units with exposures of 0.5 - 1.5 seconds in daylight.

AD-A016 122/4GA PC$3.75/MF$2.25
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Physical Sciences Directorate
Turbulence Measurements from the Army Gas Dynamics Laser Range.
Technical rept.,
Dorathy Anne Stewart. 26 Feb 75, 29p Rept no. RR-75-8
Contract DA-1-T-662621-AH-81

Descriptors: *Atmospheric motion, *Turbulence, Gas dynamic lasers, Anemometers, Analysis of variance, Power spectra, Fourier analysis, Micrometeorology.

This report describes wind measurements at the US Army Missile Command on the test range for the Army Gas Dynamics Laser. Fast-response instruments for measuring three perpendicular components of the wind were attached at five levels on each of six towers. Approximately six minutes of data were recorded on each of nine magnetic tapes. A variance analysis was made for each case. Both power spectrum and Fourier analyses were also performed. It was concluded that the mean wind and its turbulent characteristics vary significantly from one end of the range to the other.

AD-A016 130/7GA PC$3.25/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
World Areas with Higher Precipitation Intensities and Frequencies than the Tropic Test Center, Canal Zone.
Research note,
Thomas E. Niedringhaus. Aug 75, 25p Rept no. USAETL-RN-0022

Descriptors: *Precipitation, *Rainfall intensity, Environmental tests, Materiel, Army operations, Risk, Volume, Correlation techniques, Meteorological charts, Panama Canal.
Identifiers: Tropic Test Center.

The report presents a series of maps showing the areas of the world that have more severe precipitation intensities and a greater frequency of days with precipitation than the Caribbean and Pacific coast sites of the Tropic Test Center in the Canal Zone, Panama. The maps provide a basis for analyzing the risk of employing Army materiel in areas where it may be subjected to more severe impact and wetting effects from precipitation than those encountered during testing. The study indicates that the Caribbean coast, as represented by Colon (Coco Solo), has more extreme precipitation intensities and frequencies than the Pacific coast, as represented by Howard Air Force Base; thus, the maps based on data from Colon show considerably smaller areas of exceedance than the maps based on data from Howard AFB. The highest precipitation intensities, the smallest areas of exceedance, and, consequently, the

least risk of an operational environment being more severe than the testing environment are associated with Colon in October and November. For precipitation frequencies, the maps reveal very small areas that exceed Colon in mean annual number of days with precipitation, but considerably larger areas that have more days with precipitation than Howard AFB.

AD-A016 251/1GA PC$11.50/MF$2.25
Naval Weather Service Command Washington D C
Summary of Synoptic Meteorological Observations. Siberian Coastal Marine Areas. Volume 1. Area 1 - Wrangel Island, Area 2 - SW Chukchi Sea, Area 3 - Anadyrskiy Gulf, Area 4 - Khatyrka, Area 5 - Khatyrka 340S, Area 6 - Karaginskiy Island, Area 7 - Kronotskiy Peninsula.
Oct 75, 455p

Descriptors: *Synoptic meteorology, *Marine meteorology, *Coastal regions, *Siberia, Meteorological data, Air water interactions, Climate, Atmospheric precipitation, Fog, Cloud cover, Ceiling, Visibility, Atmospheric temperature, Thunderstorms, Wind velocity, Wind direction, Ocean waves, Chukchi Sea.
Identifiers: Wrangel Island, Anadyrskiy Gulf, Karaginskiy Island, Kronotskiy Peninsula.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSD Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

COM-75-11345/6GA PC$4.25/MF$2.25
Ohio State Univ., Columbus. Dept. of Aeronautical and Astronautical Engineering.
Theoretical Study of Vortex Breakdown in Tornado-Like Vortices.
Final rept.,
O. R. Burggraf, and M. R. Foster. Jun 75, 61p
3722-F NOAA-75082607
Grant NOAA-04-3-022-37

Descriptors: *Tornadoes, *Vortices, Partial differential equations, Reynolds number, Navier-Stokes equations, Numerical integration.

Observations of mature tornadoes indicate that a 'bulge' often forms on the visible core just prior to withdrawal of the funnel from the ground. Laboratory experiments indicate that this bulge corresponds to a phenomenon called vortex breakdown, in which a bubble of reversed flow forms on the axis of the tornado vortex. In this study, the quasi-cylindrical equations for a tornado-like vortex jet are considered in order to clarify conditions under which the solution will breakdown at a finite height or continue indefinitely. It was found that breakdown occurs when the effective axial momentum flux (flow force) is less than a critical value; for higher values of flow force, the solution continues indefinitely, with Long's (1961) similarity solution as terminal state. When applied to the conditions of the 1957 Dallas tornado, the computed breakdown location is in conformity with Hoecker's analysis of the observations.

COM-75-11394/4GA PC$12.00/MF$2.25
National Ocean and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
OPEN SESAME, Severe Environmental Storms and Mesoscale Experiment, Proceedings of the Opening Meeting at Boulder, Colorado, on September 4-6, 1974,
D. K. Lilly. Jun 75, 497p

Descriptors: *Storms, *Meteorological data, *Meetings, Research projects, Clouds(Meteorology), Boundary layer flow, Tornadoes, Atmospheric sounding, Radiosondes, Upper atmosphere, Meteorological charts, Meteorological instruments.
Identifiers: SESAME project.

The report is a record of the proceedings of the SESAME (Severe Environmental Storms And Mesoscale Experiment) opening meeting held at Boulder, Colorado on September 4-6, 1974. The meeting was held to acquaint the meteorological research community with the existence and scope of a planned research project, the Severe Environmental Storms and Mesoscale Experiment (SESAME), and to solicit the community's advice and participation. Some of the areas discussed and examined in this report are: the NOAA Observational Program, Vertical Sounding problems and solutions, SESAME Data management, the Severe Storm environment, the Boundary Layer, Mesoscale Modeling, Cloud and Severe Storm Modeling, Recent Severe Storm and Tornado Observations, Dissents and Additions, and Management Plan and University. Also included are the results of the SESAME questionnaire that was distributed at the meeting.

NTIS/PS-75/761/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Clear Air Turbulence (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Guy E. Habercom, Jr. Oct 75, 237p*
Supersedes NTIS/PS-75/008.

Descriptors: *Bibliographies, *Clear air turbulence, Meteorological phenemena, Meteorological radar, Atmospheric temperature, Atmospheric circulation, Detectors, Aviation safety, Abstracts.

Clear air turbulence and its relationship to air transportation is documented in these Government-sponsored research reports. Its meteorological occurrences, its detection, and aircraft encounters with the phenomena are investigated. (Contains 232 abstract).

N75-30672/0GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A Generalized Tensor Formulation of Atmosphere and Seas Dynamics.
L. M. Avis, R. E. Turner, and T. H. Rees. Sep 75, 65p NASA-TR-R-441, L-9928

Descriptors: *Atmospheric models, *Computerized simulation, *Ocean models, *Tensor analysis, *Vertical motion, Adiabatic conditions, Fronts (Meteorology), Mathematical models, Temperature inversions.

For abstract, see STAR 1321

N75-30723/1GA PC$170.50
Engineering Sciences Data Unit, London (England).
Characteristics of Atmospheric Turbulence Near the Ground. Part 3: Variations in Space and Time for Strong Winds (Neutral Atmosphere).
Jul 75, 31p ESDU-75001
Subm-Sponsored by Roy. Aeron. Soc., Inst. Of Chem. Engr., Inst. Of Mech. Engr., and Inst. Of Structural Engr.

Descriptors: *Atmospheric turbulence, *Ground wind, *Wind velocity, Aerodynamic loads, Atmospheric boundary layer, Graphs (Charts), Lapse rate, Surface properties, Terrain, Wind effects.

For abstract, see STAR 1321

N75-30732/2GA PC$3.25/MF$2.25
Chicago Univ., Ill. Dept. of Geophysical Sciences.
Characteristics of Anvil-Top Associated with the Poplar Bluff Tornado of 7 May 1973.
E. W. Pearl. 7 May 73, 13p NASA-CR-143348, SMRP-119
Contracts NGR-14-001-008, NOAA-04-4-158-1

Descriptors: *Meteorological parameters, *Radar tracking, *Thunderstorms, *Tornadoes, Anvil clouds, Radar echoes, Statistical analysis, Visual observation.

For abstract, see STAR 1321

N75-30733/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Nature of Multiple Solutions for Surface Wind Speed over the Oceans from Scatterometer Measurements.
J. C. Price. Jul 75, 17p NASA-TM-X-70949, X-913-75-175
Subm-Submitted for Publication.

Descriptors: *Ocean surface, *Scatterometers, *Seasat-a satellite, *Wind velocity, Backscattering, Data processing, Problem solving.

For abstract, see STAR 1321

N75-30734/8GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Climatic Change by Cloudiness Linked to the Spatial Variability of Sea Surface Temperatures.
J. Otterman. Apr 75, 54p NASA-TM-X-70941, X-910-75-54
Subm-Submitted for Publication.

Descriptors: *Climatology, *Cloud cover, *Ocean surface, *Surface temperature, Earth albedo, Meteorological charts, Meteorological parameters, Sea states, Weather.

For abstract, see STAR 1321

PAT-APPL-581 063/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Organic Nucleating Agent for Both Warm and Cold Clouds.
Patent Application,
Aaron N. Fletcher. Filed 27 May 75, 7p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fog dispersal, *Dispersants, Patents, Nucleation, Alcohols.
Identifiers: *Patent applications, PAT-CL-239-2, *Propane diol/hydroxymethyl-methyl.

Methods for the dispersal of both warm and cold fogs with 1,1,1-tris-(hydroxymethyl)ethane are disclosed in this patent application. Warm fogs are dispersed by spraying hot aqueous solutions of the material into the fogged area. Cold fogs are dispersed by generating smokes containing submicron particles of the material and dispersing the smokes within the fogged area.

PB-245 257/1GA PC$7.25/MF$2.25
Purdue Univ., Lafayette, Ind. Water Resources Research Center.
The Stochastic and Chronologic Structure of Rainfall Sequences. Application to Indiana.
Technical rept.,

M. Levent Kavvas, and Jacques W. Delleur. Aug 75, 218p TR-57 W75-11854, OWRT-B-036-IND(10)

Descriptors: *Rainfall, *Indiana, Rainfall intensity, Stochastic processes, Time series analysis, Mathematical models, Seasonal variations, Precipitation(Meteorology), Statistical analysis, Variance(Statistics), United States.

The report is in two parts: The first is concerned with the point stochastic analysis of the daily rainfall occurrence in Indiana, and the second with the time series analysis of the monthly and the annual rainfall sequences at various stations in Central United States. The point statistical analysis used some statistical functions and tests of hypotheses. There are cyclicities both in the first and second moments of the point stochastic process. Physically meaningful annual and 15-day cycles were found to be significant. There is a slight downward trend in the rate of daily occurrence in Indiana. The Neyman-Scott cluster process was constructed in the time dimension to model this physical persistence. In the time series analysis, a theoretical and empirical analysis of the removal of cyclicities was performed; however differencing could not be used for the generation purposes although it did remove the cyclicities in the data. Standardization, although it introduces some spurious nonstationarities into the data, is an acceptable method for generation purposes. A spectral and a variance-time analysis of the ARIMA family of the hydrologic time series models was done to study their long range dependence characteristics. For the annual rainfall series a white noise model with normally distributed residuals is adequate and can be used for hydrologic simulation purposes in the Central United States.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A015 684/4GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Cambridge Operations Research Center
Estimation of Fractiles for Order Point Determination.
Technical rept.,
Uday S. Karmarkar. Aug 75, 27p Rept no. TR-114
Contract N00014-75-C-0556

Descriptors: *Inventory control, Lead time, Statistical analysis, Stochastic processes, Bayes theorem, Estimates.
Identifiers: Demand(Economics), Economic order quantity.

Inventory stocking problems with stochastic demand typically involve an estimate of the location of some fractile of the demand distribution, where the fractile is usually in the 0.8 - .99 range. This fractile is termed the 'service level' and is the probability that demands will be satisfied from stock on hand. The conventional approach of using the Normal model to estimate this location can sometimes be misleading since it uses information about the center of the distribution to predict behavior in the tail of the distribution. A new method based on a mixture model is proposed for directly estimating the location of the appropriate fractile. A formal Bayesian approach is presented and heuristic smoothing methods are developed. The statistics to be collected can be interpreted as the proportion of backorders and the average quantity backordered in each period. The estimate obtained is biased in general but robust in the sense that it works well for a variety of distributions. The performance of this method is superior to the conventional approach with some qualifications.

AD-A015 685/1GA PC$7.25/MF$2.25
Massachusetts Inst of Tech Cambridge Operations Research Center
Multilocation Distribution Systems.
Technical rept.,
Uday S. Karmarkar. Sep 75, 209p Rept no. TR-117
Contracts N00014-75-C-0556, N00014-75-C-0661

Descriptors: *Inventory control, Mathematical programming, Stochastic processes, Convex sets, Network flows, Scheduling, Mathematical models.
Identifiers: *Multilocation distribution systems, *Stochastic programming, Convex programming.

A 'Multilocation Distribution System' is a system for the distribution of goods that may be held at more than one location in the system. This thesis is concerned with the shipping and stocking decisions made in such a system at the short term planning level, involving setting of stock targets and service levels, positioning of stock, and making cost versus service level tradeoffs when the demands to be met are stochastic. The problem and its important characteristics are described and a framework for identifying problems is developed. The literature, both methodological and applied, is reviewed and discussed critically. The major approaches and their merits and shortcomings are described, and it is asserted that there is a close connection between the stochastic distribution problem and the literature in stochastic programming. This assertion is borne out by examining a simple but general type of distribution problem using programming techniques and showing that it yields convincingly to the treatment.

AD-A015 686/9GA PC$7.00/MF$2.25
Massachusetts Inst of Tech Cambridge Operations Research Center
Hierarchical Integration of Planning and Control.
Technical rept.,
Jonathan J. Golovin. Sep 75, 200p Rept no. TR-116
Contracts N00014-75-C-0556, N00014-75-C-0661

Descriptors: *Management planning and control, *Jobs, Scheduling, Production control, Decision making, Inventory control, Mathematical models, Costs, Mathematical programming, Theses.
Identifiers: *Job scheduling, *Job shop scheduling.

This report suggests a complete and consistent set of models for hierarchical planning. Although the detailed scheduling environment specifically dealt with in the paper is the closed flow shop, the methodology developed is general and applicable to any intermittent production process as well as to many service institutions. In the development of the overall planning method the author gives several new algorithms and formulations for solving specific parts of the overall problem.

AD-A015 690/1GA PC$3.75/MF$2.25
Yale Univ New Haven Conn School of Organization and Management
Variance Reduction Techniques for an Inventory Simulation.
Technical rept.,
Richard Ehrhardt. Sep 75, 31p Rept no. TR-4
Contracts N00014-75-C-0241, DAHC04-75-C-0079

Descriptors: *Inventory control, Analysis of variance, Monte Carlo method, Computerized simulation, Normal density functions, Mathematical models.

The author evaluates several variance reduction schemes for use in simulating inventory control systems. The methods investigated include several variants of antithetic variates, control variates and conditional Monte Carlo. Of these, it is found that the conditional Monte Carlo approach is the best single method. Slightly improved results are obtained when this method is combined with antithetic sampling.

AD-A015 691/9GA MF$2.25
Yale Univ New Haven Conn School of Organization and Management
Multi-Item Inventory System Policies Using Statistical Estimates: Negative Binomial Demands (Variance/Mean = 9). Appendices.
Technical rept.,
Arthur S. Estey, and Ronald L. Kaufman. Sep 75, 291p Rept no. TR-3-App
Contract N00014-75-C-0241, Grant DAHC04-75-G-0079
Report on Project 'Decision Control Models in Operation Research'. See also AD-A015 810.
Availability: Available in microfiche only.

Descriptors: *Inventory control, *Analysis of variance, Replenishment, Standard deviation, Cost analysis, Estimates, Forecasting, Tables(Data), Computerized simulation.
Identifiers: Demand(Economics).

As part of the on-going research program in 'Decision Control Models in Operations Research', this work has investigated the behavior of multi-item inventory control systems in which the underlying demand distributions are estimated from a limited sample of historical observations. The actual distributions used are from the negative binomial family of distributions with variance/mean equal 9. Particular stress is placed on evaluating how well simple-to-use replenishment rules operate in an uncertain environment. Especial attention is paid to the role of the estimate of the variance of the demand distribution and its effect on the relative performance of the replenishment policies. The research approach employes both mathematical analysis and time series methods for computer simulations.

AD-A015 750/3GA PC$4.25/MF$2.25
Douglas Aircraft Co Long Beach Calif
Why System Engineering and System Functional Analysis for Total System Design,
Robert E. Corrigan, Roger A. Kaufman, and Harold Bauer. Jan 65, 58p Rept no. DAC-LB-32142

Descriptors: *Systems engineering, *Management planning and control, Decision making, Systems analysis, Logic, Information processing, Learning, Teaching methods.
Identifiers: *Programmed instruction, *Serial learning, *Systems development.

The report is a programmed instruction manual describing logical sequences in the development of a systems approach to design engineering.

AD-A015 810/5GA PC$5.25/MF$2.25
Yale Univ New Haven Conn School of Organization and Management
Multi-Item Inventory System Policies Using Statistical Estimates: Negative Binomial Demands (Variance/Mean = 9).
Technical rept.,
Arthur S. Estey, and Ronald L. Kaufman. Sep 75, 109p Rept no. TR-3
Contract N00014-75-C-0241, Grant DAHC04-75-G-0079

Report on Project Decision Control Models in Operations Research. See also appendices, AD-A015 691.

Descriptors: *Inventory control, *Analysis of variance, Decision theory, Dynamic programming, Estimates, Mathematical models, Forecasting, Replenishment.
Identifiers: Demand(Economics).

In a previous study, MacCormick considered the control of multi-item inventory systems when knowledge of the underlying demand distributions is incomplete. In his simulation study, the distributions actually generating the demands were either Poisson or negative binomial (variance/mean = 3). This report employs negative binomial distributions (variance/mean = 9) to explore the impact of a higher variance of demand on system performance. It also treats the importance of the level of knowledge of the true variance of demand. Whereas much of the theoretical inventory research literature assumes that the probability distributions for demand are exactly known, real life implementation of such systems must inevitably statistically estimate the parameters of the demand distributions. This investigation examines multi-item system behavior of selected operating characteristics as a function of the statistical procedures adopted in implementing stockage rules.

AD-A015 877/4GA PC$7.00/MF$2.25
Army War Coll Carlisle Barracks Pa
Professional Development of the Military Executive (Under the Officer Personnel Management System).
Group research project,
Llyle J. Barker, Jr., Chester F. Cambell, Herbert M. Dixon, Glenn H.Finkbiner, and Gurnie C. Gunter. 27 May 75, 198p

Descriptors: *Personnel management, *Officer personnel, *Promotion(Advancement), Jobs, Job analysis, Job training, Skills, Careers, Selection, Attitudes(Psychology), Leadership, Questionnaires, Policies, Army, Navy, Air Force.
Identifiers: *Officer Personnel Management System, OPMS(Officer Personnel Management System).

The basic thrust of this project is to determine the attitudes and perceptions of the officer corps concerning Officer Personnel Management System and its objectives. By way of comparison, a cursory look was taken at the systems presently in force within the United States Air Force and United States Navy. Additionally, research was conducted on executive development within the industrial sector. While the officer corps generally agrees with the basic tenets of OPMS and feel that the quality of executives will gradually be improved, there is a strong tendency to 'wait and see' if the Army will make the system work. (Author)

AD-A016 034/1GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Analysis of Government/Contractor Interaction as a Motivator of Contractor Performance.
Master's thesis,
Jack R. Runkle, and Gerald D. Schmidt. Aug 75, 98p Rept no. SLSR-19-75B

Descriptors: *Contract administration, *Management engineering, Contracts, United States government, Interactions, Hypotheses, Performance, Correlation techniques, Ratings, Motivation.
Identifiers: Contractors.

The purpose of this study was to determine whether 'influential government/contractor interaction' can be used to focus top management's attention on contractual performance. The hypothesis states that a relationship exists between the formal structure of 'influential government/contractor interaction' and documented contractor performance ratings. Data were collected at five NASA Centers and included 323 performance ratings on fifty-six contracts over a period of eight years. The data were tested for significant relationships using a stepwise linear regression model which considered the effects of organizational level and interaction frequency on the performance rating, in addition to nine other variables which potentially affected the performance rating.

AD-A016 276/8GA PC$5.75/MF$2.25
Stanford Univ Calif Dept of Engineering-Economic Systems
Modeling and Decision Analysis.
Technical rept. 1 May 73-31 May 75,
Steven Nobumasa Tani. 30 Jun 75, 149p Rept no. EES-DA-75-3
Contract N00014-67-A-0112-0077

Descriptors: *Decision making, *Decision theory, Uncertainty, Mathematical models, Stochastic processes, Multivariate analysis, Probability, Theses.
Identifiers: Sensitivity analysis, Utility functions, Decision trees, Profits, Lotteries.

The author uses mathematical modeling in decision analysis to help obtain a 'better' profit lottery than can be assessed directly. The concept of the authenticity of probabilities is introduced to define the measure of 'goodness' of the profit lottery. The role of modeling is to simplify the assessment task through the decomposition of the profit lottery. However, budgetary constraints force one to make approximations in the modeling process and thereby causes one to misstate the profit lottery. The models used in a decision analysis should be regarded as subjective expressions of uncertainty rather than as objective descriptions of the real-world. A methodology is presented that quantitatively relates the modeling approximations made in a decision analysis to the results of the analysis.

N75-30917/9GA PC$9.25/MF$2.25
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
An Optimum Organizational Structure for a Large Earth-Orbiting Multidisciplinary Space Base.
Ph.D. Thesis - Fla. State Univ., 1973.
J. M. Ragusa. Jun 75, 304p NASA-TM-X-3233

Descriptors: *Optimization, *Organizations, *Space stations, Analogs, Personnel management, Project management.

For abstract, see STAR 1321

PB-245 152/4GA PC$3.25/MF$2.25
Young (Arthur) and Co., Washington, D.C.
Development of Management Tools.
Final rept.
Aug 75, 25p PDR-AY-87-51R
Contract HUD-H-2139R

Descriptors: *Contract administration, *Research management, Management information systems, Research projects, Residential buildings, Government policies, National government, Planning programming budgeting, Recommendations, Monitors.

The report provides a summary description of the management information system developed for use by the Office of Policy Development and Research to monitor the status of research contracts. Results of a survey of government technical representatives which led to the development of a separate contract monitoring system are described. Recommendations are made on additional features that might be added to the management information system, and on improvements that might be made in the overall program and budget management system.

PB-245 208/4GA PC$3.75/MF$2.25
Marketing Science Inst., Cambridge, Mass.
Public Policy and Product Information. Summary Findings from Consumer Research.
Summary rept.,
G. S. Hutchison. 1975, 43p NSF/RA/S-75-054
Contract NSF-GI-42037

Descriptors: *Consumers, *Commodity management, *Publicity, Information, Product development, Communications management, Promoting, Public relations, Research.
Identifiers: Public policy, Product information.

The report presents the findings of an Assessment of Consumer Information Processing Research in Relation to Public Policy Needs. The first section studies the public policy setting. The main body of the digest reviews, examines, and interprets the existing CIP literature, in terms of the components of Consumer information processing, CIP methods and measures, and problem zones. The final section focuses on conclusions and implications, and lays out directions for future CIP research. Among the conclusions drawn were (1) An improved definition and delineation of 'information' has to be developed and (2) the distinction between 'applied' and 'basic' research orientations needs to be emphasized.

PB-245 224/1GA PC$4.25/MF$2.25
Consumer Product Safety Commission, Washington, D.C.
Handbook and Standard for Manufacturing Safer Consumer Products.
Jun 75, 74p* CPSC-75-620-10

Descriptors: *Consumers, *Commodity management, *Safety, *Handbooks, Publicity, Manufacturers, Standards, Product development, Quality assurance, Packaging, Policies, Legislation, Liabilities.
Identifiers: *Consumer products, *Product safety.

A system standard for manufacturing safer consumer products is presented and analyzed. If followed carefully by manufacturers, the system standard will help insure that virtually no unsafe products will be produced. The standard states that safety must be designed into and built into consumer products at every stage of production. The elements of the comprehensive system approach described in this document include: Training in product safety for the manufacturer's staff; safe design of products, anticipating any potential hazards; careful record-keeping when ordering component parts, inspecting and testing products, and distributing the finished product; monitoring of every step in the process of production, insuring safety and quality; care in final packaging of the product for distribution; and prompt and thorough recall and repair if any products are found to be unsafe.

5B. Documentation and Information Technology

AD-A015 652/1GA PC$3.25/MF$2.25
Informatics Inc Rockville Md
SOVRaD - A Digest of Recent Soviet R and D Articles. Volume 1, Number 7, July 1975,
S. Hibben, L. Boylan, J. Kourilo, B. Shresta, and M. Ness. Jul 75, 17p
Contract MDA903-76-C-0099, DARPA Order-3097
See also report dated Jun 75, AD-A014 478.

Descriptors: *Scientific research, *USSR, *Periodicals, Magnetohydrodynamic generators, Composite materials, Superconductors, Alloys, Optics, Plasmas(Physics), Laser beams, Ionosphere.

Contents: Ceramic for MHD generator; Aluminum-steel composite; New high-temperature superconducting material; Densification and metallization of condensed matter by shock waves; New boron nitride crystalline form; Soluble heat-resistant aromatic polyimides; Alloyed pyrographite; High strength and heat-resistant chromium alloy; Heat and thermal oxidation resistant poly(organosilazoxanes); Ocean optics research method; Optical characteristics of a point source in the ocean; Ocean water transparency; Magnetic effect on light propagation in water; Discharger for mega-ampere switching; Sawtooth e-beam pulse generator; The ELING electron gun; Generation of 'superjets'; Plasma diagnostics device; Criticism of computer use; Acoustic 'laser'; Mission of the Polish military academy of technology; Suspension of fusion microballoons; Seeing IR laser radiation; Determining density state on a semiconductor surface; R-F heating of the ionosphere; R-F beam effects on the ionosphere.

AD-A015 683/6GA PC$3.25/MF$2.25
Value Engineering Co West Long Branch N J
Multi-Coded Microfilm Feasibility Study.
Technical memo.,
R. W. Johnson, and L. G. Volkheimer. Aug 75, 21p PA-TM-2187
Contract DAAA21-73-C-0639

Descriptors: *Microfilm, Reading machines, Compatibility, User needs, Assessment, Coding, Engineering, Information retrieval, Data storage systems, Test methods, Performance(Engineering).

The objective of this analysis is to determine the feasibility of using a multi-coded microfilm on commercial hardware. The coded film includes Miracode (binary-coded microfilm), Document Mark (image count), and Bar (line) Code. The intention is to include as many as possible or all of the above codes on a single film so as to provide retrieval on virtually any system hardware. Of primary importance is determining the practicability of data retrieval of a multi-coded film on manually operated, motor-driven microfilm readers, as well as on various terminals.

AD-A015 742/0GA PC$5.25/MF$2.25
Air Force Academy Colo
Annual Research Progress Report No. 10 (Final), 1 July 1974 - 30 June 1975.
Jul 75, 108p

Descriptors: *Air force research, Abstracts, Aeronautics, Computers, Military engineering, Life sciences, Social sciences, Political science, Weapon systems, Logistics, Reprints.
Identifiers: Military academies, Air Force Academy.

Partial Contents: Scientific and Engineering Investigations -- Dept. of Aeronautics, Dept. of Astronautics and Computer Science, Dept. of Civil Engineering, Engineering Mechanics and Materials, Dept. of Electrical Engineering, and Dept. of Life and Behavioral Sciences; General Research in the Humanities and Social Sciences -- Dept. of English and Fine Arts, Dept. of Economics, Geography and Management, Dept. of History, Dept. of Law, and Dept. of Political Science and Philosophy; Research and Analysis of Space and Weapon Systems; and Manpower, Procurement and Logistics Studies.

AD-A015 886/5GA PC$4.25/MF$2.25
Army Communications Command Fort Huachuca Ariz
Proceedings of the Military Librarians' Workshop (18th) Held at Fort Huachuca, Arizona on 10-12 September 1974.
12 Sep 74, 65p
See also report dated 9 Jul 74, AD-782 803.

Descriptors: *Military publications, *Libraries, *Meetings, Documents, Information centers, History, Military facilities, Interpersonal relations.

152 military librarians participated in the workshop sessions devoted to 'Interpersonal Communication,' and in the group meetings following the workshop sessions. Highlights, recommendations and conclusions of the workshop sessions and group meetings are presented in the proceedings.

AD-A015 906/1GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
Technical Writing: Its Importance in the Engineering Profession and Its Place in Engineering Curricula - A Survey of the Experience and Opinions of Prominent Engineers.
Final rept.,
Richard M. Davis. 9 Aug 75, 85p Rept no. AU-5-75-AFIT/EN

Descriptors: *Technical writing, *Engineers, *Public opinion, Courses(Education), Training, Questionnaires, Surveys.

A questionnaire was sent to prominent successful engineers to determine their experience with technical writing, their opinions about its importance to an engineer, and their opinions about its place in the engineering curriculum. The replies indicate that the respondents spend 24 percent of their time writing, that the writing that they do is very important to their positions, and that the ability to write effectively has helped them in their own advancement. They spend 31 percent of their time working with material written by others, are acutely conscious of the need for effective written communications, and find fault with many of the written communications with which they deal. They indicate that the ability to write is usually important or critical when a man is considered for advancement.

AD-A015 967/3GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Investigation of the Requirements for Base Engineering Automated Management System (BEAMS) Products Currently Generated and Their Effectiveness.
Master's thesis,
Craig A. Birch, and James N. Roberts. Aug 75, 70p Rept no. SLSR-47-75B

Descriptors: *Management information systems, Civil engineering, Military facilities, Data bases, Effectiveness, Maintenance management, Logistics support, Computer applications, Utilization, Questionnaires, Acceptability, Air Force, Theses.
Identifiers: BEAMS(Base engineer automated management system), Base engineer automated management system.

In 1968, Air Force Civil Engineering introduced the Base Engineer Automated Management System (BEAMS). This computerized system, designed to fulfill civil engineering managers' informational needs, now generates over 100 products. The purpose of this research was to determine which BEAMS products, if any, were not meeting the informational needs of these civil engineering managers. In particular, 26 BEAMS products which are specified for distribution to the Base Civil Engineer, the Chief of Programs, the Chief of Operations and Maintenance Branch, or the Industrial Engineer examined. Questionnaires were developed to obtain the opinions of these four managers. A random sample of these managers stationed within the contiguous United States was selected to participate in the survey. Civil engineering managers were generally satisfied with the 26 BEAMS products which were investigated. Four products were perceived as not useful by one category of civil engineering managers, Chiefs of Programs. Six products were perceived by either BCEs or Chiefs of Programs as not effective in at least one area.

AECL-5002/40 PC$4.75/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
List of Publications, April 1974 to March 1975.
Apr 75, 33p
U.S. Sales Only.

Descriptors: (*Aecl, *Bibliographies), Information retrieval, Research programs.

For abstract, see NSA 32 08, number 21772.

COM-75-11290/4GA PC$4.75/MF$2.25
Office of Telecommunications, Washington, D.C. Telecommunications Analysis Div.
Program Impact Estimation for Community Information and Service Centers (CISC's),
Cleve Hopkins. Jul 75, 88p* OTR-75-68

Descriptors: *Information centers, *Urban areas, Local government, Information systems, Telecommunications, Surveys, Community relations, Attitudes, Public opinion.
Identifiers: *Social indicators, Community information and service centers, Government services, Community facilities.

The impact of government programs may be estimated (a) by measuring the attitudes of citizens before and after program activation, and (b) by noting the change in selected social indicators before and after program activation. This paper describes the application of these procedures to local areas within city governments with emphasis on the installation of Community Information Service Centers (CISC's) using advanced telecommunications technology. A literature survey is included.

ERDA-41 PC$7.60/MF$2.25
Energy Research and Development Administration, Washington, D.C. Div. of Administrative Services.
Wash/Erda Report Index. Wash and Erda Reports Listed by Number. Key-Word-out-of-Context (Kwoc) Index to Report Titles.
Jul 75, 187p

Descriptors: (*Us aec, *Bibliographies), (*Us erda, Bibliographies), Research programs.

For abstract, see NSA 32 08, number 21779.

EUR-5177e PC$4.25/MF$2.25
Commission of the European Communities, Luxembourg.
Report on the Activities of the Committee for Information and Documentation on Science and Technology (Cidst) of the European Communities for 1972 and 1973.
1974, 22p
U.S. Sales Only.

Descriptors: (*European communities, *Documentation), Data processing, Information, Information systems.

For abstract, see NSA 32 08, number 21773.

N75-30508/6GA PC$4.75/MF$2.25
National Research Council of Canada, Ottawa (Ontario).

Quarterly Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment, 1 January - 31 March 1975.
31 Mar 75, 83p DME/NAE-1975(1), ISSN-0047-9055

Descriptors: *Aeronautical engineering, *Marine technology, *Mechanical engineering, *Surface navigation, Aerodynamics, Flight tests, Human factors engineering, Hydraulic control, Lubricants, Research projects.

For abstract, see STAR 1321

N75-30932/8GA PC$3.25/MF$2.25
Southwest Research Inst., San Antonio, Tex. Dept. of Bioengineering.
Preparation of an Information Brochure and Exhibit of NASA Technology Applications.
Final Report.
R. L. Wilbur. Aug 75, 9p NASA-CR-144393
Contracts NAS9-14225, SWRI PROJ. 13-4000

Descriptors: *Bioinstrumentation, *Biomedical data, *Technology utilization, Display devices, Information dissemination, Visual aids.

For abstract, see STAR 1321

N75-30951/8GA PC$3.75/MF$2.25
ABT Associates, Inc., Cambridge, Mass.
Urban Development Applications Project. Urban Technology Transfer Study.
Final Report.
1 Jan 75, 33p NASA-CR-144363, AAI-75-79
Contract NAS9-13752

Descriptors: *Selective dissemination of information, *Technology transfer, *Urban development, Information management, Management methods, Problem solving, Technology utilization.

For abstract, see STAR 1321

5C. Economics

AD-A015 665/3GA PC$5.25/MF$2.25
Rand Corp Santa Monica Calif
National Security and Export Controls,
Robert E. Klitgaard. Apr 74, 108p Rept no. R-1432-1-ARPA/CIEP
Contract DAHC15-73-C-0181, ARPA Order-189

Descriptors: *International trade, *Security, *Computers, *Economics, *Commerce, USSR, Control, Data processing, Political science, Minicomputers, Trade off analyses, Costs, Decision making.
Identifiers: *Export controls, *National security, Embargoes, Restrictions.

An examination of the analytical issues and the decisionmaking process in determining the national security impact of our export control policy. Currently, a good can be restricted if two questions can be answered affirmatively: (1) Does it have military uses. (2) It is not producible or obtainable in communist countries. Analysis of the decisionmaking process, especially as it relates to the export of large computers, suggests the following improvements: (1) Redefine the criteria to go beyond mere technological assessment, (2) incorporate economic considerations, and (3) consider the broader political uses of export controls. (Author)

AD-A016 032/5GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Analysis of Non-Behavioral Factors Affecting Work Order Time and Cost Productivity.
Master's thesis,
Joseph H. Cox, Jr., and Joseph B. Lewis, Jr. Aug 75, 103p Rept no. SLSR-18-75B

Descriptors: *Production engineering, *Management engineering, *Civil engineering, *Air Force planning, Mathematical models, Computer applications, Factor analysis, Correlation techniques, Personnel management, Cost effectiveness, Time, Theses.
Identifiers: BEAMS(Base Engineer Automated Management System), Base engineer automated management system, Productivity.

The improvement of productivity of the civil engineering work force has long been a goal of Air Force Civil Engineering managers. Each year the requirement to do more work with less resources has become more and more pronounced. The first step in any increase is the identification of those factors with a direct bearing on productivity. The authors of this thesis have taken actual work order and shop data from a U.S. Air Force base and developed linear mathematical models using multiple linear regression analysis to identify those nonbehavioral factors with a direct or inverse relationship to productivity. After testing the models for statistical significance, the authors conclude that a linear relationship exists between certain work order and shop parameters and the amount of time and cost productivity for a given shop.

AD-A016 187/7GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
On a Pilot Linear Programming Model for Assessing Physical Impact on the Economy of a Changing Energy Picture.
Technical rept.,
George B. Dantzig, and S. C. Parikh. Aug 75, 18p Rept no. SOL-75-14R
Contracts N00014-75-C-0865, N00014-75-C-0267

Descriptors: *Economic models, *Linear programming, Mathematical models, Forecasting, Computations.
Identifiers: *Energy forecasts, *Economic forecasting, Input output models.

This paper deals with a dynamic linear programming model on a pilot scale that attempts to describe in physical terms many of the technological interactions within and across the sections of the American Economy, including a detailed energy sector. The general aim of the model is to provide information on what the country would achieve over the long run in physical terms in the face of a changing energy picture. The model is expected to (1) incorporate most recent available data of sufficiently good quality (albeit in an aggregated form) that it can be used to generate some meaningful scenarios showing how the economy might be affected if the energy picture evolves in a specific way, and (2) provide us at the Systems Optimization Laboratory a prototype for research in solving large-scale linear programming models of energy systems.

AD-A016 217/2GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
A Note on the Objective Junction for the Pilot Model.
Technical rept.,
George B. Dantzig. Aug 75, 10p Rept no. SOL-75-20
Contracts N00014-75-C-0865, N00014-75-C-0267

Descriptors: *Linear programming, Consumers, Consumption, Mathematical models.
Identifiers: *Energy consumption, Prices, Demand(Economics).

It is shown that if the objective for a linear programming model is chosen to be the weighted sum of people at different consumption levels, where the weights are equal to consumption levels measured in base-year prices, then the prices of the physical flow model will be comparable to base year prices in that people given the same income less taxes and savings will be able to purchase the same bill of goods; moreover prices will remain invariant if they use their demand functions to buy a different bill of goods. It is also shown that if industries use their respective production to change their inputs to maximize production, this will also increase the objective gross national consumption.

COM-75-50547/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
The Proposed Department of Commerce 'Voluntary' Labeling Program.
Final rept.,
Melvin R. Meyerson. 3 Nov 73, 2p
Pub. in Proceedings of Technical Seminar for College Educators of Home Equipment, Dallas, Tex., 1-3 Nov 73, p9-10.

Descriptors: *Industrial management, *Labels, *Electric appliances, Energy, Conservation, Gas appliances, Classifications, Tests, Comparison, Semantics, Consumer affairs, Specifications, Opinions, Public relations, Monitors, Operations.
Identifiers: Voluntary standards, Energy conservation, Compliance.

The features of the Department of Commerce Program for the voluntary labeling of major household appliances and equipment to effect energy conservation are presented. These procedures were published in the Federal Register on October 26. The steps involved in carrying out the program are (1) setting of priorities among products, (2) establishment of product classes where appropriate, (3) setting of test methods to be used, (4) developing a system for comparing the efficiency of similar products, (5) development of a label that is meaningful to consumers, (6) publication of a Proposed Label Specification in the Federal Register with time for comment, (7) evaluation of comments, (8) publication of the Final Label Specification, (9) education of the public as to the meaning of the program, and (10) monitoring of the program to insure compliance.

PB-245 314/0GA PC$5.75/MF$2.25
National League of Cities, Washington, D.C. Urban Observatory Program.
Local Government Policy Choices in Industrial Location and Employment: The Prospect in Five American Cities.
Final rept.,
Eugene Smolensky, and Morgan Reynolds. Oct 74, 142p UO-LCCM-74-006
Contract HUD-H-987

Descriptors: *Central city, *Economic surveys, Municipalities, Sociometrics, Industrial relations, Plant location, Employment, Benefit cost analysis, Industries, Policies, Data acquisition, Populations.
Identifiers: Industrial development.

This report synthesizes the findings of the regional economic analysis study conducted in the five Urban Observatory cities participating in this comparative research project. It quantifies the rates of change in population and socio-economic characteristics of residents of the central cities, the level and composition of employment by industry and occupation, and the effect of these changes on central-city earnings, property values, tax receipts and expenditures. Following an introductory statement of the problem and purpose of the study, the report provides a comparative description of the five and other cities; details the industries studied and the method by which they were selected in each city; discusses what was learned about the locational determinants of the key industries; evaluates the benefits and costs of stimulating growth in these industries;

and considers the broader policy implications of industrial location.

5D. History, Law, and Political Science

AD-A015 721/4GA PC$5.25/MF$2.25
CACI, Inc.-Federal, Arlington, Va.
Crisis Inventory.
Final rept. 1 Jan-30 Jun 75,
James A. Moore. Aug 75, 122p
Contract N00014-75-C-0627, DARPA Order-2928
See also report dated Apr 75, AD-A008 397.

Descriptors: *International relations, *Emergencies, Classification, Policies, Theory, Research management, Definitions, Variables, Management planning and control, Data bases.
Identifiers: *Crisis situations, International crises, Trends, Crisis management.

The work reported is principally concerned with the development of an international crisis typology in which classes are distinguished by important policy and theoretical differences. The objective of the research is to provide a basis for conducting and organizing research on different classes of crises. The report presents a definition of international crisis, identifies 72 international crises in the post-World War II era and presents extensive data on each. These data include brief narrative summaries as well as quantitative data on 22 variables that are important from a policy and/or theoretical perspective.

N75-30931/0GA PC$4.25/MF$2.25
Washington Univ., St. Louis, Mo. Center for Development Technology.
Continuing Professional Education: Status, Trends, and Issues Related to Electronic Delivery.
D. Rothenberg. Aug 75, 74p NASA-CR-143329, CG-75/5
Contracts NGR-26-008-054, NSF EC-38841

Descriptors: *Education, *Electronics, *Engineering, *Law (Jurisprudence), *Physicians, Economic factors, Licensing, Regulations.

For abstract, see STAR 1321

PB-245 410/6GA PC$8.75/MF$2.25
Ragan (James) Associates, Pacific Palisades, Calif.
The Water Pollution Control Act of 1972 Institutional Assessment, Public Participation.
Final rept.
Oct 75, 278p* NCWQ-75/11
Contract WQ5AC045

Descriptors: *Water law, *Participative management, *Public opinion, Legislation, Law enforcement, National government, Regulations, Interest groups, Attitude surveys, National government, State government, Local government.
Identifiers: *Water pollution abatement, *Federal water pollution control act of 1972.

Public Participation under Section 101(e) of the Federal Water Pollution Control Act Amendments of 1972 is reviewed as it exists at the federal, state and local levels. Authors conclude that the law has not changed the nature of participation as practiced in the past. The general unaffiliated public is not interested in participation. However, a few national and Washington-based public interest groups have made specific impacts on the administration of the Act. Federal and state agencies do not know what to do with citizen comments and the regulations established by the U.S. Environmental Protection Agency have proved inadequate to obtain minimum performance. While the Act requires that citizen involvement be an integral component of NPDES, planning, and construction grants programs, EPA has isolated public participation from the functional programs.

5E. Human Factors Engineering

N75-30148/1GA PC$4.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Human Comfort Response to Random Motions with a Dominant Transverse Motion.
R. W. Stone, Jr.. May 75, 94p NASA-TM-X-72694

Descriptors: *Acceleration stresses (Physiology), *Comfort, *Passenger aircraft, Graphs (Charts), Human factors engineering, Human reactions, Power spectra.

For abstract, see STAR 1321

5G. Linguistics

AD-A015 648/9GA PC$3.75/MF$2.25
Speech Communications Research Lab Inc Santa Barbara Calif
On Adopting a Common Task for ARPA Speech Understanding Systems.
Interim rept.,
David Brill, and Beatrice T. Oshika. Sep 75, 26p
Contract N00014-73-C-0221

Descriptors: *Speech recognition, *Computational linguistics, Systems analysis, Semantics, Information retrieval, Grammars, Lexicography, Syntax.

The report investigates the implications of adopting a common task which might be shared by speech understanding systems being developed under Advanced Research Projects Agency support by Bolt Beranek and Newman, Carnegie-Mellon University, and System Development Coporation-Stanford Research Institute. Current task domains, lexicons, and syntax, semantics and pragmatics components of the three systems are described, and the characteristics of a possible common task are outlined. It is clear that mechanisms exist within all three systems to deal with a common task, but the implementation of such a task is considered feasible only as a long-range objective.

5H. Man-Machine Relations

N75-30799/1GA PC$3.25/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
Manipulation Based on Sensor-Directed Control: An Integrated End Effector and Touch Sensing System.
J. W. Hill, and A. J. Sword. 1973, 8p NASA-CR-143420
Contracts SNSN-63, NAS2-7507
Conf-Presented at 17TH Ann. Human Factors Soc. Conv., Washington D. C., 16-18 Oct. 1973.

Descriptors: *Automatic control, *Manipulators, *Sensors, Algorithms, Digital computers.

For abstract, see STAR 1321

5I. Personnel Selection, Training, and Evaluation

AD-A015 628/1GA PC$3.75/MF$2.25
Navy Personnel Research and Development Center San Diego Calif
Further Investigations of Coding/Rehearsal Strategies During a Segmented Lecture Format.
Final rept.,
Gary S. Thomas, Edwin G. Aiken, and William A. Shennum. Sep 75, 30p Rept no. NPRDC-TR-76-15
See also report dated Sep 75, AD-A015 285.

Descriptors: *Lectures, *Teaching methods, Instructions, Learning, Memory(Psychology), Schools, Students, Performance(Human), Instructors, Training.

Data from a previous lecture-learning study were combined with data from the current study to provide information on the effects of a filler task used in the previous study, and to compare other coding/rehearsal strategies that have potential for improving learning in a lecture. Results showed that the filler task only slightly reduced performance on a delayed recall test; confirmed a previous finding that, when coding/rehearsal is separated from listening in a lecture setting, recall increases significantly; and indicated that procedures which aid/guide the students' coding/rehearsal behaviors further enhance learning.

AD-A015 631/5GA PC$4.25/MF$2.25
Atlantic Fleet Fpo New York 09501 Cruiser-Destroyer Group Two/Destroyer Development Group
Ship Controlman Rating for U.S. Navy Ships.
Final rept.,
R. Sniffin, Stephen G. Kmetz, and C. Henry DeBow. 1975, 56p Rept no. CCDG2/DDG-TR-9-75

Descriptors: *Ship bridges, *Control, Personnel development, Ratings, Training, Teaching methods, Job satisfaction, Attitudes(Psychology), Motivation, Skills, Job analysis, Test methods.

The report is a description and concept evaluation of the desirability of instituting a Ship Controlman rating on U.S. Navy Ships. Two Atlantic ships participated in the study. Analysis of at-sea data and observation demonstrate that Ship Control as a rating should not be instituted by the Navy.

AD-A015 666/1GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
The Role of Remedial Training in the Naval Service: One Last Chance for Many Recruits,
Anne Hoiberg. Feb 75, 20p Rept no. 75-17
Presented at Research Conference on the Social Psychology of Military Service, held at Chicago Univ., Center for Continuing Education, 23-25 Apr 75.

Descriptors: *Naval training, Effectiveness, Recruits, Literacy, Physical fitness, Motivation, Attitudes(Psychology), Personality, Reading, Skills, Enlisted personnel, Naval personnel, Marine Corps personnel, Military training, Trainees, Platoon level organizations, Performance(Human), Optimization.
Identifiers: Remedial training.

This study examined the effectiveness of 3 naval service remedial programs. Academic remedial training was established to raise the literacy of marginal Navy recruits to at least the fifth grade level and to help these men function effectively during their enlistments. The physical conditioning platoon was instituted in the Marine Corps to help physically marginal and overweight Marine recruits improve their physical fitness and self-confidence. For those Marine recruits who have difficulty adjusting to recruit training, a motivation platoon was created to promote greater acceptance of and involvement in the service. Even though many literacy trainees did not attain the desired final fifth grade reading level, the mean gain in reading skills was over a year, and for those with final reading scores over the fifth grade, there were many more effective than noneffective sailors. Positive improvements in attitudes, per-

ceptions of their bodies, and personality characteristics were obtained for trainees assigned to the physical conditioning platoon and motivation platoon. The objectives of each program were achieved.

AD-A015 687/7GA PC$4.25/MF$2.25
Texas Christian Univ Fort Worth Inst of Behavioral Research
Correlates of First-term Reenlistment Behavior Aboard Navy Ships.
Technical rept.,
John R. Bruni, Allan P. Jones, and Lawrence R. James. 1 May 75, 62p Rept no. IBR-75-8
Contract N00014-72-A-0179-0001

Descriptors: *Reenlistment, *Attitudes(Psychology), Job satisfaction, Careers, Naval personnel, Personnel development, Recruiting.

Retention of adequate numbers of Naval personnel upon completion of their first enlistment is crucial not only because of the prohibitive costs of replacing certain highly trained specialists, but also due to the need for experienced, competent, and committed personnel in the higher enlisted ranks. However, as a result of the shift to an all-volunteer military environment, the Navy must now compete more directly with civilian industry for its manpower. The present study explored facets of the shipboard work environment which were related to the reenlistment behavior of sailors in the final two years of their first enlistment. Reenlistment behavior was investigated for both individuals and types of divisions aboard Naval ships. Individual reenlistment behavior was related to socio-economic variables and external satisfaction, and to the sailor's psychological climate or perceptions of his work milieu. Psychological climate dimensions of greatest importance to reenlistment were Professional and Organizational Esprit de Corps, and Job Challenge, Variety and Importance.

AD-A015 699/2GA PC$5.75/MF$2.25
Draper (Charles Stark) Lab Inc Cambridge Mass
Mathematical Model of an Air Cushion Vehicle.
Final rept. 8 Jun 73-8 Nov 74,
Damon Cummings, Edward Kern, Stanley Shursky, and Ronald Yeung. May 75, 135p
NAVTRAEQUIPC-73-C-0138-1
Contract N61339-73-C-0138

Descriptors: *Naval training, *Air cushion vehicles, *Landing craft, Training devices, Simulators, Mathematical models, Pilots, Computer programs, Ship motion, Mission profiles, Equations of motion, Control systems, Wind, Water waves, Real time.
Identifiers: JEFF B air cushion vehicles.

This report describes the development of a mathematical model of the Bell Aerospace Air Cushion Vehicle Landing Craft (JEFF-B). The model is intended for use in a real time hands on pilot training simulator. Equations of motion, cushion dynamics, control and machinery dynamics and water wave effects are modeled.

AD-A015 702/4GA PC$3.75/MF$2.25
Stanford Univ Calif Inst for Mathematical Studies in the Social Sciences
The Improvement and Individualization of Computer-Assisted Instruction.
Final rept. 1 Aug 70-31 Jul 75,
Marian Beard, Avron Barr, Dexter Fletcher, and Richard C. Atkinson. 15 Sep 75, 35p
Contract N00014-67-A-0112-0054, ARPA Order-2284

Descriptors: *Computer aided instruction, Teaching methods, Learning, Vocabulary, Foreign languages, Training, Theory, Memory(Psychology), Computer programming, Courses(Education), Students, Performance(Human).
Identifiers: *Mnemonics.

The report summarizes research on the improvement and individualization of instruction, with reference to a theoretical framework of optimization, and specific applications in computer-assisted instruction (CAI). Two projects involved the acquisition of foreign-language vocabulary items. Experiments with Spanish and Russian items showed that the method could be a powerful aid in building and retaining a large vocabulary of foreign words. Two CAI courses in computer programming were developed. The first provided instruction and practice in the Algebraic Interpretive Dialogue (AID) language, and was used to investigate various optimization and individualization techniques, on the level of single problems as well as over entire lessons. The BASIC Instructional Program (BIP) was developed as a vehicle for CAI research in optimal selection of instructional material by means of an internally stored curriculum description and a model reflecting the student's changing state of knowledge. Each project is discussed briefly, with references to the publications that describe the research in detail.

AD-A015 719/8GA PC$4.75/MF$2.25
American Institutes for Research Washington D C
Methods for Predicting Job-Ability Requirements: IV. Task Characteristics, Ability Requirements, and Problem-Solving Strategies.
Final rept. 15 Mar 72-30 Sep 75,
George R. Wheaton, Andrew M. Rose, and Paul W. Fingerman. Sep 75, 83p Rept nos. AIR-31300-9/75-FR, AIR-R75-2
Contract N00014-72-C-0382
See also report dated Apr 75, AD-A010 469.

Descriptors: *Aptitudes, *Performance(Human), Problem solving, Aptitude tests, Naval personnel, Jobs, Predictions, Maintenance, Factor analysis, Auditory signals.
Identifiers: *Abilities, Task performance.

The report describes the fourth and final study in a program of research dealing with the relationships between the characteristics of human tasks and the abilities required for task performance. The goal of the program has been to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. Such knowledge has important implications for both selection and training of personnel. The three previous studies examined the relationship between variations in an auditory signal identification, a troubleshooting, and a problem-solving task, and consequent changes in the abilities related to task performance. The results of these studies were that complex changes in the ability requirements related to performance occurred in response to variations in task characteristics. In the fourth and final study, possible interactions among task variations, ability profiles and subject strategies were examined within the context of the troubleshooting and problem-solving tasks previously studied. In general, knowledge of a subject's problem-solving strategy was useful in obtaining a clearer understanding of ability requirements under different conditions of task performance.

AD-A015 722/2GA PC$3.75/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Effectiveness of a Pilot Ground Trainer as a Part Task Instrument Flight Rules Flight-Checking Device - Stage I.
Interim rept. Apr-Sep 74,
Robert J. Ontiveros. Sep 75, 50p Rept no. FAA-NA-74-51 FAA-RD-75-36

Descriptors: *Training devices, *Pilots, Flight simulation, Instrument flight, Skills, Assessment, Simulators, Approach.

The first stage of a two-stage experiment was conducted at the National Aviation Facilities Experimental Center (NAFEC) to determine the effectiveness of a pilot ground trainer for training noninstrument-rated pilots in instrument approaches and related instrument flight procedures. Ten private pilots were trained to perform very high frequency omnirange station (VOR), automatic direction finder (ADF), and instrument landing system (ILS) approaches. The pilot ground trainer represented a single-engine general aviation aircraft. The subjects' flight performance capability, achieved through ground trainer instruction, was evaluated by a flight check in an instrument-equipped Cessna 172. The report provides information about trainer equipment and capabilities which contributed to the positive transfer. Procedural maneuver situations which resulted in minimal training transfer are discussed in terms of desirable ground trainer capabilities which could enhance the effectiveness of the pilot ground trainer for performing instrument flight approaches.

AD-A015 749/5GA PC$3.75/MF$2.25
Air Force Human Resources Lab Brooks AFB Tex
The Effects of Adjunct Instructional Materials Employed Outside the Classroom on the Performance of Air Force ROTC Students.
Final rept. Aug 72-Nov 74,
Robert H. Sulzen, and Donald L. Thomas. Jul 75, 35p Rept no. AFHRL-TR-75-5

Descriptors: *Instructional materials, *Air Force training, Learning, Teaching methods, Auxiliary, Textbooks, Effectiveness, Assessment, Military reserves, Officer personnel, Air Force personnel, Transfer of training.

This study was designed to evaluate the effectiveness of adjunct instructional materials, when used under unstructured conditions outside the classroom. Adjunct instructional materials are questions and answers keyed to a text. The adjuncts for the study were prepared for textbooks used with two Air Force ROTC courses. Over 400 students at two universities served as subjects. Four experiments were conducted using a counterbalanced repeated measures design. Students used adjunct materials for portions of the text and served as a control for other portions of the text. The results indicate that adjunct materials promote learning of materials directly covered by adjunct questions, but do not contribute to application of the material covered by adjunct questions. The use of adjunct instructional materials is recommended. Further research, especially concerning the effects of various types of questions, also is recommended. (Author)

AD-A015 754/5GA PC$7.00/MF$2.25
Air Force Human Resources Lab Brooks AFB Tex
Training Line Simulator (Enhanced Version). Revised User's Manual.
Final rept. 1 Nov 73-31 Dec 74,
Manuel Pina. Jun 75, 179p Rept no. AFHRL-TR-75-25
See also AD-779 952.

Descriptors: *Air Force personnel, *Air Force training, Basic training, Recruits, Computer programming, Network flows, Mathematical models, Assessment, Computerized simulation, Planning.

The training line simulator (TLS) was reprogrammed to run on the AFHRL UNIVAC 1108. This revised user's manual partially documents this effort by providing an updated manual for prospective users of TLS. The training line

simulator was designed as a managerial aid for investigating and evaluating the various and diverse policy interactions which impact on basic military training and entry-level technical training courses. This user's manual provides user-oriented documentation in sufficient detail to give the prospective user a complete grasp of the concepts and logic underlying the model. The manual is divided into three chapters: (1) description of system functions, (2) description of system modules, and (3) user instructions.

AD-A015 755/2GA PC$3.25/MF$2.25
Air Force Human Resources Lab Brooks AFB Tex
Procedure for Determining Grades of Officer Positions.
Interim rept. 1 Mar-30 Apr 75,
Joe T. Hazel, and James B. Carpenter. Jul 75, 25p Rept no. AFHRL-TR-75-31

Descriptors: *Officer personnel, *Job analysis, Manpower, Requirements, Management engineering, Regression analysis, Military organizations, Personnel management, Rates, Scaling factors.

This report describes a procedure for determining appropriate grades for officer jobs. The method involves application of a nine-variable equation for computing a composite score and use of a conversion table for translating this score into a specific grade level, lieutenant through colonel. An explanation and illustration of the seven steps in the method is provided as follows: (1) preparation and review of a job description, (2) obtaining five factor ratings, (3) obtaining grade ratings, (4) derivation of organization level variable values, (5) derivation of supervisor's judged-grade value, (6) computation of an integer-weighted composite score, and (7) conversion of the composite score to an equivalent officer grade.

AD-A015 756/0GA PC$3.75/MF$2.25
Air Force Human Resources Lab Brooks AFB Tex
Systematic Method for Establishing Officer Grade Requirements Based Upon Job Demands.
Interim rept. 1 Aug 74-28 Feb 75,
Raymond E. Christal. Jul 75, 42p Rept no. AFHRL-TR-75-36

Descriptors: *Officer personnel, *Job analysis, Manpower, Requirements, Management engineering, Regression analysis, Military organizations, Personnel management, Rates, Scaling factors.

The report presents interim results of a study developing a methodology for management engineering teams to determine the appropriate grade requirements for officer positions based upon job content and responsibilities. The technology reported represents a modification and extension of methods developed between 1963 and 1966. Results indicated that Manpower and Management Engineering personnel can accurately apply the Officer Grade Requirements (OGR) determination procedure. Recommendations are made for operational implementation and for determining the total distribution of non-aircrew officer grade requirements.

AD-A015 758/6GA PC$3.25/MF$2.25
Air Force Human Resources Lab Brooks AFB Tex
Familiarity with Subordinates' Jobs: Immediate versus Secondary Supervisors.
Interim rept. Jan 67-Dec 71,
Llwellyn N. Willey. Jun 75, 22p Rept no. AFHRL-TR-75-7

Descriptors: *Supervisors, *Proficiency, Performance(Human), Ratings, Efficiency, Measurement, Skills.
Identifiers: Supervisors employee ratings.

A test was made of the hypothesis that only immediate supervisors know enough about their subordinates' job activities to render job performance ratings. Pairs of supervisors who rated the quality of performance of Supply airmen had identified themselves as immediate supervisors and other-than-immediate supervisors. These pairs, working independently, rated the same airmen on how well they performed individual tasks. Each supervisor was asked to rate each task that he was sure the subordinate did, but he was not told which tasks the subordinate had identified. The selections of tasks were tallied against the responses made by the incumbents on the same inventory. An incumbent's responses were relative time spent ratings. Tasks were classified by a scale of percent time spent, and two supervisory levels were compared in terms of percentage of tallies ('agreements') with the incumbents.

AD-A015 835/2GA PC$4.25/MF$2.25
Systems Research Labs Inc Dayton Ohio
Functional Integrated Systems Trainer: Technical Design and Operation.
Final rept. 1 Jun 73-15 Dec 74,
Bertram W. Cream, and David C. Lambertson. Jun 75, 60p AFHRL-TR-75-6(II)
Contract F33615-73-C-4134

Descriptors: *Training devices, *Flight crews, Job analysis, Cost analysis, Simulators, Gunships, Performance(Human), Teaching methods, Efficiency.

A functional integrated systems trainer was designed and constructed for training four members of the Gunship AC-130E/H crew in their individual and crew coordination tasks. The design was based on the behavioral task analysis conducted by the Tactical Air Command (TAC) instructional systems development team and further refined by Air Force Human Resources Laboratory. The trainer is installed and currently being used by TAC. An extensive evaluation was conducted which focused on the actual training value of the device. The findings showed that it provided effective training, validated the design concepts/techniques, and the cost effectiveness of functional, low cost part task trainers. It also provided significant additional information pertaining to the design and utilization of such devices and their applications to other systems. This report provides a detailed description of the construction and operation of the device.

AD-A015 888/1GA PC$3.25/MF$2.25
Army Medical Intelligence and Information Agency Washington D C
Alpine Training for Austrian Soldiers (Alpinausbildung-Eine Notwendigkeit im Oesterreichischen Bundesheer),
Horst Schneider. 6 Oct 75, 5p Rept no. MIIA-K-5918
Trans. of Truppendienst; Zeitschrift fuer die Ausbildung im Bundesheer (Austria) v14 n2 p155-156 1975.

Descriptors: *Military training, *Mountains, Infantry, Skiing, Warfare, Mobility, Translations, Austria.

Training involves the continuous effort to impart knowledge and skills. The operational employment determines the procedures as well as the scope and scale of the training. The precedence given the individual training branches can be derived from this employment. The expected use of the soldier in a specific terrain or employment of technical means determines the augmentation of purely military training by special training branches. The problem mostly lies in setting up special training within the general military training operation. For this reason, Alpine training should not lead to the 'Alpinist' but to the mountain soldier.

AD-A015 900/4GA PC$7.00/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
Communications-Electronics Utilization Field, AFSCs 301X, 302X, 303X, 304X, 305X, 306X, 307X, 309X.
Occupational survey rept.
31 Jul 75, 178p Rept no. AFPT-90-30X-196

Descriptors: *Personnel development, *Officer personnel, *Communication and radio systems, Job analysis, Careers, Job training, Air Force personnel, Questionnaires, Surveys.
Identifiers: *Career ladders.

The report describes the first operational occupational survey of an officer utilization field. The survey was conducted by the Occupational Survey Branch, USAF Occupational Measurement Center, Air Training Command, during September-December 1974. In September 1973, the Air Force Human Resources Laboratory, as a result of extensive research, released methods for occupational analysis of officer utilization fields for operational implementation. This report describes the method used to conduct the officer survey, analysis of results of the survey, examples of the application of officer surveys to career field structure and training, and presents conclusions and recommendations about surveys of officer utilization fields.

AD-A015 952/5GA PC$4.75/MF$2.25
Naval Academy Annapolis Md
The Effect of Naval Academy Training on the Decision Styles of Individuals.
Research rept.,
Robert B. Bush. 22 May 75, 82p Rept no. USNA-TSPR-64
Report on a Trident Scholar Project.

Descriptors: *Naval training, *Decision making, Management training, Students, Naval personnel, Personality, Motivation, Environments.
Identifiers: Naval academy, Plebes, Trident scholar project.

This report has attempted to determine that the Naval Academy training - in particular of Plebe year - affected the style with which a person makes decision. The second objective of this project was to determine what factors in the Naval Academy environment caused these changes, or influenced a person in his decision-making process. The areas of personality/motivational characteristics in comparison to decision styles and neurological output in relation to decision styles were also studied. The report describes the concept of decision styles and the approach used in the study. The use of percentage analysis and analysis of variance determined significant results. (Author)

AD-A016 022/6GA PC$7.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Investigation of the Job Requirements and Resources of the Air Force Civil Engineering Foreman.
Master's thesis,
Frederick S. Gersh, and Yasumi Nagai. Aug 75, 225p Rept no. SLSR-44-75B

Descriptors: *Civil engineering, *Air Force personnel, Management training, Job analysis, Leadership, Engineers, Supervisors, Surveys, Questionnaires, Theses.

The United States Air Force has facilities throughout the world. The Base Civil Engineering Organization constructs, operates, and

maintains these facilities. The first-level foreman is the link between the Base Civil Engineer (BCE) labor force and its management structure. He directly affects the accomplishment of the BCE mission. Top level civil engineering managers have questioned the existing formal Air Force foreman training program. Also, they believe the foremen have too many duties to be effective managers of their work force. Research data were gathered from questionnaires sent to twenty-six bases. Personnel surveyed were Base Civil Engineers, Operations and Maintenance Chiefs, second-level foremen or superintendents, and first-level foremen.

AD-A016 030/9GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Study of Job Satisfaction as it Relates to the System Program Office and the Weapon Acquisition Process.
Master's thesis,
David M. Rigsbee, and Charles T. Roof. Aug 75, 118p Rept no. SLSR-22-75B

Descriptors: *Job satisfaction, *Air Force personnel, Weapon systems, Acquisition, Job analysis, Creativity, Planning, Motivation, Questionnaires, Surveys, Theses.

The purpose of this study was to examine job satisfaction as it related to the system program office and the weapon acquisition process. The weapon acquisition process was defined and various satisfaction and motivational theories were discussed. Professors Hackman and Oldham devised and validated an instrument called the Job Diagnostic Survey (JDS) which was administered to 230 randomly selected SPO personnel who had been grouped into three categories. Category I consisted of individuals who work in the conceptual and validation stages; Category II was comprised of individuals who work in the full-scale development stage; and Category III included those individuals who work in the production and deployment stages. The results of the 180 respondents were statistically evaluated and summarized.

AD-A016 041/6GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Evaluation of the Air Force Advanced Academic Degree Management System (AADMS).
Master's thesis,
Arnold L. Julich, and Marjorie A. O'Connell. Aug 75, 104p Rept no. SLSR-45-75B

Descriptors: *Education, *Air Force personnel, Requirements, Assessment, Graduates, Universities, Courses(Education), Surveys, Questionnaires, Theses.

The purpose of the research was to determine if the present Advanced Academic Degree Management System provides an adequate method of identifying and establishing advanced academic degree requirements needed to accomplish the Air Force mission. Two specific objectives were identified: determine if the current AADMS provides only valid AAD requirements; and provide the AADMS with an objective test to establish valid AAD requirements, thereby improving justification of Air Force requirements for outside interests such as the Congress. A survey was developed using questions drawn both directly from accepted Air Force criteria and indirectly using the results of previous research. This survey was administered to a sample of 160 officers from within Air Force Logistics Command.

AD-A016 054/9GA PC$4.75/MF$2.25
B-K Dynamics Inc Rockville Md
The Application of Clustering Techniques to Enlisted Force Management.
Technical rept. Jun 74-Jun 75,
W. Franklin Spencer. 31 Jul 75, 85p Rept no. BKD-TR-3-199
Contract N00015-72-C-0526

Descriptors: *Clustering, *Personnel management, Enlisted personnel, Naval personnel, Operations research.

A rationale, a set of objectives, and a philosophy of application for the employment of clustering analysis in problem solving for Naval enlisted force management planning are presented after a brief introduction to clustering techniques and philosophy in other fields. New similarity measures based on costing deviations of the actual enlisted force structure from an ideal force structure are proposed and shown superior to the traditional similarity measures. Special concepts and considerations related to clustering in enlisted force management planning are discussed.

AD-A016 108/3GA PC$3.75/MF$2.25
Human Resources Research Organization Alexandria Va
Establishing the Concepts and Techniques of Performance-Oriented Training in Army Training Centers: A Summary Report,
John E. Taylor. Jun 75, 49p Rept no. HumRRO-TR-75-21
Contract DAHC19-73-C-0004
See also AD-743 851.

Descriptors: *Army training, *Teaching methods, Army personnel, Individualized training, Performance(Human), Facilities, Basic training, Transfer of training.
Identifiers: Self paced training, All volunteer military services.

The report describes the activities and accomplishments of Work Unit ATC-PERFORM in a three-year effort to assist the Army in the review, evaluation, and refinement of performance-based training in Army Training Centers. ATC-PERFORM continued and extended the Army's first effort to effect major training innovations in its conversion to an all-volunteer status. Under ATC-PERFORM, HumRRO staff members working in close coordination with Army representatives of the appropriate proponent schools and training centers, undertook subefforts in (1) Basic Training (Basic Combat Training for Men, Basic Training for Women, and BCT skill retention), (2) Advanced Individual Training, Combat (Infantry, Armor, Field Artillery, and Air Defense Artillery), (3) Advanced Individual Training, Combat Support (Signal, Transportation, Ordnance, Clerical, Quartermaster, and Military Police), (4) self-pacing of instruction in supply and heavy equipment courses, (5) NCO leadership and instructor training courses, and (6) training for Reserve Components.

AD-A016 189/3GA PC$5.75/MF$2.25
Human Resources Research Organization Alexandria Va
Performance of First-Tour WAC Enlisted Women: Data Base for the Performance Orientation of Women's Basic Training.
Final rept. Jul 73-Mar 75,
H. Alton Boyd, L. Paul Dufilho, Jacklyn E. Hungerland, and John E. Taylor. Aug 75, 149p Rept no. HumRRO-FR-WD(CA)75-10
Contract DAHC19-73-C-0004

Descriptors: *Basic training, *Females, *Performance(Human), Enlisted personnel, Attitudes(Psychology), Ratings, Supervisors.

The report summarizes data on duties, activities, and attitudes of a representative worldwide sample of 1,573 first-tour enlisted women (EW) as reported by themselves and a representative sample of 156 of their supervisors. Data were gathered by questionnaire from first-tour EW, and by both questionnaire and interview from supervisors. The report describes the introduction of performance-oriented instructional procedures into Women's Basic Training (BT) at Fort McClellan, and the revision of Army Training Program 21-121 to incorporate the philosophy and principles of performance-oriented training.

AD-A016 220/6GA PC$3.75/MF$2.25
Rand Corp Santa Monica Calif
The Social Cost of Maintaining a Military Labor Force.
Interim rept.,
Richard V. L. Cooper. Aug 75, 41p Rept no. R-1758-1-ARPA
Contract DAHC15-73-C-0181, DARPA Order-189-1

Descriptors: *Manpower utilization, *Military personnel, Cost analysis, Social welfare, Labor, Volunteers.
Identifiers: All volunteer military services, Social characteristics.

The report is a reassessment of the social costs associated with draft and no-draft military forces. Although public attention tends to center on budget costs, the more relevant variable from the standpoint of public policy is social cost, since this is the price that society as a whole pays for maintaining a military labor force. This analysis shows that social welfare losses are possible both with and without the draft. Those associated with the draft are several times larger than those associated with a volunteer military, but recent significant force reductions raise the possibility that the military labor force will be reduced to a level below what is socially optimal. More generally, the analysis suggests the importance of social cost as a measure useful to public policy.

AD-A016 244/6GA PC$3.75/MF$2.25
Chief of Naval Education and Training Support Pensacola Fla
An Effectiveness Evaluation Between Manual and Automated Readability Counting Techniques.
Final rept.,
Gary R. Bunde. Aug 75, 32p Rept no. CNETS-5-75

Descriptors: *Counting, Automatic, Reading, Words(Language), Technical writing.

A statistical comparison was made between two automated devices which were used to count words, sentences and syllables (data points which are needed in the Flesch Reading Ease Score to determine the reading grade level of written material). The devices are the Automated Flesch Count (AFC) developed by Kincaid and McDaniel and the Navy Automated Counter (NAC) developed by the Navy to conduct a readability study of rate training and correspondence manuals. Comparisons were made between the speed and reliability of the automated devices, and between the speed and reliability of each device and the manual method of counting data points. Similar reliabilities were found for both of the devices and for the manual method.

AD-A016 248/7GA PC$3.75/MF$2.25
Yale Univ New Haven Conn Dept of Administrative Sciences
Conditions Under Which Employees Respond Positively to Enriched Work.
Technical rept.,
Greg R. Oldham, J. Richard Hackman, and Jone L. Pearce. Sep 75, 27p Rept no. TR-10
Contract N00014-75-C-0269
Prepared in cooperation with Illinois Univ. at Urbana, Champaign.

Descriptors: *Job satisfaction, *Personnel development, Performance(Human), Job analysis, Motivation, Work, Production, Requirements, Attitudes(Psychology).
Identifiers: Productivity.

The research tests the moderating effects of (1) employee growth need strength and (2) level of satisfaction with the work context on employee responses to enriched work. Data were collected from 201 employees who work on 25 jobs in a bank. Results show that employees who have strong growth needs and also are satisfied with the work context (i.e., with their pay, job security, co-workers and supervisors) respond more positively to enriched jobs than do employees who have weak needs for growth and/or who are dissatisfied with the work context. Implications for the practice of work redesign are discussed.

AD-A016 268/5GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Evaluation of the Air Force Logistics Career Area Advanced Academic Degree Position Validation Process.
Master's thesis,
Aleck L. Biehl, and Ronald J. Sonnier. Aug 75, 79p Rept no. SLSR-9-75B

Descriptors: *Job analysis, *Requirements, *Logistics, Education, Graduates, Air Force personnel, Personnel development, Assessment, Universities, Surveys, Interviewing, Theses.
Identifiers: Degree courses.

Reduced funding for educational programs indicated that a thorough review should be made of the Advanced Academic Degree (AAD) validation process. This reduction in funding necessitates more effective management of the AAD program in the logistics career areas to insure that officers in these career areas require those skills learned through these education programs to effectively accomplish the logistics mission. This study addresses this problem by conducting an analysis of the logistics AAD program. The researchers evaluated 845 requests for AAD positions based on criteria such as: duties and responsibilities of the position, organizational level of the position, proper alignment between Air Force Speciality Code (AFSC) and the AAD code requested and finally, the written justification of the request.

AD-A016 269/3GA PC$7.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Simulation Approach to Determine Communications Maintenance Manpower Requirements.
Master's thesis,
Donald W. Klovstad, and Ronald M. Rhodes. Aug 75, 210p Rept no. SLSR-10-75B

Descriptors: *Communication and radio systems, *Maintenance personnel, Manpower, Requirements, Personnel, Computerized simulation, Theses.

The Logistics Composite Model (L-COM), jointly developed by the Air Force Logistics Command and the Rand Corporation, was designed to address aircraft operations, maintenance and support concepts. Also, L-COM is a validated simulation model that represents aircraft operations and the resulting demands for resources. Using maintenance as the key link between aircraft operations and communications, the authors theorized that the operations of a base communications maintenance system is similar in many ways to the operation of an aircraft maintenance system. After reviewing both maintenance operations (aircraft and communications) the authors constructed communication maintenance models within the framework of the Logistics Composite Model. The communication models that were constructed, after testing, indicated that L-COM could be modified to realistically represent an Air Force communications system.

N75-30634/0GA PC$3.75/MF$2.25
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
The Focus Series 1975: A Collection of Single-Concept Remote Sensing Educational Materials.
S. M. David. 1975, 47p NASA-CR-144396, LARS-IN-052975
Contracts NAS9-14016, NGL-15-005-112

Descriptors: *Education, *Multispectral band scanners, *Pattern recognition, *Remote sensors, Computer techniques, Photointerpretation, Photomapping, Training devices.

For abstract, see STAR 1321

PAT-APPL-540 047/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Flight Simulator Visual Display System.
Patent Application,
William Clausen Yager. Filed 10 Jan 75, 24p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Flight simulators, *Naval training, *Photographic projectors, Display systems, Visual signals, Human factors engineering, Aeronautical engineering, Man machine systems, Performance tests, Corrections, Combat readiness, Patents.
Identifiers: PAT-CL-353-10, *Patent applications, Perspective(Vision).

This patent application relates to visual displays for flight simulators and in particular to visual displays including apparatus for correcting perspective.

PAT-APPL-588 987/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Composite Polarized Film for Use in a Weapon Training Simulator.
Patent Application,
Gottfried R. Rosendahl, and Windell N. Mohon. Filed 20 Jun 75, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Naval training, *Gunnery trainers, *Motion picture film, Patents, Simulation, Optical equipment, Electronic equipment, Background, Target acquisition, Light, Feedback, Firing error indicators, Performance(Human), Colors.
Identifiers: *Patent applications, PAT-CL-35-25, Polarized light.

The patent application uses optics and electronics in the field of simulation and has a particular reference to gunnery training without the requirement of live ammunition. A past and continuing need exists to train military in simulated combat conditions in a safe, low-cost manner without the requirement of live ammunition.

PAT-APPL-593 071/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Universal Infantry Weapons Trainer.
Patent Application,
Albert H. Marshall, John H. Dillard, Frank J. Oharek, and Robert J. Entwhistle. Filed 3 Jul 75, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Naval training, *Gunnery trainers, Motion picture film, Simulation, Optical equipment, Electronic equipment, Feedback, Patents, Infrared equipment, Accuracy, Firing error indicators, Photographic projectors, Circuits.
Identifiers: PAT-CL-35-25, *Patent applications.

The patent application relates to the arts of optics and electronics in the field of simulation, and has particular reference to gunnery training via simulation and without the requirement of live ammunition.

PB-245 140/9GA PC$10.50/MF$2.25
Case Western Reserve Univ., Cleveland, Ohio. Dept. of Organization and Administration.
Job Satisfaction and Productivity. An Evaluation of Policy Related Research on Productivity, Industrial Organization and Job Satisfaction: Policy Development and Implementation.
Final rept.,
Suresh Srivastva, Paul F. Salipante, Jr., Thomas G. Cummings, William W. Notz, and John D. Bigelow. 1975, 409p* NSF/RA/S-75-052
Grant NSF-GI-39455
Library of Congress Catalog Card No. 75-24063.

Descriptors: *Productivity, *Job satisfaction, Personnel, Attitudes, Job analysis, Motivation, Organization theory, Reviews, Group dynamics, Absenteeism, Leadership, Performance, Supervision, Industrial management, Participative management.
Identifiers: Job enrichment, Organizational climate.

The study reviews empirical research published since 1959 on the relationship of industrial organization variables to job satisfaction and productivity. The review has a distinct policy focus, the objective being to apply research-based knowledge to policy development in organizations. The three types of knowledge required for this policy development are of: (1)Variables causing job satisfaction and productivity; (2) conditions under which these variables are effective; and (3) change processes which can successfully manipulate these variables. To investigate how recent research has contributed to these three types of knowledge, 57 field experiments and over 500 correlational studies are reviewed. The validity of the field experiments are intensively assessed, while the correlational studies are reviewed using a more extensive methodology.

TT-74-55073/02 PC$3.75
Office of Education, Washington, D.C.
Selected Bibliography of Educational Materials: Algeria, Libya, Morocco, and Tunisia. Volume 7, Number 2, 1973,
Azzedine Azzouz, Christiane Djemili, Margaret Duggan Saidi, and Janet Djebali. 1973, 49p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Education, *North Africa, *Bibliographies, Algeria, Libya, Morocco, Tunisia, Philosophy, Organizations, Instructional materials, Classifications, Specialized training, Programmed instruction, Translations.
Identifiers: *Maghreb countries, Dropouts.

Combatting illiteracy, preparing an often isolated youth with little broad cultural background to participate in modern society, and developing a multilingual approach are major factors in the educational philosophy in the Maghreb. A main difficulty in compiling a bibliography in this field is that most materials must come from newspapers or government publications. As far as possible other information is included. Portions of this document are not fully legible.

TT-74-55073/4 PC$4.75
Office of Education, Washington, D.C.
Selected Bibliography of Educational Materials: Algeria, Libya, Morocco, and Tunisia. Volume 7, Number 4, 1973,
Azzedine Azzouz, Christiane Djemili, Margaret Duggan Saidi, and Janet Djebali. 1973, 91p
The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Education, *North Africa, *Bibliographies, Algeria, Libya, Morocco, Tunisia, Philosophy, Organizations, Instructional materials, Classifications, Specialized training, Programmed instruction, Systems management, Translation.
Identifiers: *Maghreb countries.

Combatting illiteracy, preparing an often isolated youth with little broad cultural background to participate in modern society, and developing a multilingual approach are major factors in the educational philosophy in the Maghreb. A main difficulty in compiling a bibliography in this field is that most materials must come from newspapers or government publications. As far as possible other information is included.

5J. Psychology (Individual and Group Behavior)

AD-A015 625/7GA PC$4.25/MF$2.25
Naval Training Equipment Center Orlando Fla Training Analysis and Evaluation Group
Decision Analysis and Its Application to the Naval Education and Training Command.
Final rept.,
William C. Glauque. Jul 75, 10p Rept no. TAEG-27

Descriptors: *Decision making, *Military training, Decision theory, Computer applications, Management planning and control, Forecasting, Requirements.

The report considers decision making at the top management levels of the Naval Education and Training Command. Traditionally top management decision making relies heavily on informal techniques--intuitive judgments by experienced managers, traditions and 'rules of thumb' peculiar to each organization, or informal consensus among a group of managers. Currently, however, the training command must do a job which is unprecedented in its complexity and must do it despite declining resources. These considerations indicate the desirability of increased effectiveness in decision making. This report surveys the potential role of and desirability of more formal approaches to some top management decision problems.

AD-A015 640/6GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Sleep Loss and Sleep Deprivation as an Operational Problem,
Laverne C. Johnson. 1974, 10p Rept no. 74-45

Descriptors: *Sleep deprivation, *Flight crews, Fatigue(Physiology), Efficiency, Circadian rhythms, Rapid eye movement in sleep, Performance(Human), Stress(Physiology), Vigilance, Skills, Rest, Work, Cycles.

Effects of total sleep loss, partial sleep loss, and sleep stage deprivation are reviewed with particular attention to performance decrement and operational consequences. Within the 36-48 hour range of total sleep loss most likely to be experienced by aircrew personnel, no consistent or uniform performance decrement has been found in operational studies even though laboratory studies have found decrement on certain types of tasks, but marked increase in fatigue is a common problem. Sleep loss, both total and partial, tends to potentiate the circadian influence on performance and interact with other stressors to enhance the stress-induced physiological responses. Deprivation of sleep stage REM or sleep stage 4 produces no behavioral changes of operational consequence.

AD-A015 643/0GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Predicting Suicide Gestures in a Naval Recruit Population,
Anne Hoiberg, and Arthur Garfein. Jun 74, 22p Rept no. 74-48

Descriptors: *Recruits, *Death, Predictions, Behavior, Emotions, Naval personnel, Adjustment(Psychology), Reaction(Psychology), Stress(Psychology).
Identifiers: *Suicide.

After randomly dividing a sample of 246 suicide gesture recruits and 246 controls into validation and cross-validation subsamples, a predictive cluster of 21 statements from the Recruit Temperament Survey (RTS) was developed on the validation sample. The RTS cluster was the most powerful predictor of suicide gesture and this scale was found to be effective in differentiating suicide gesture recruits from controls. The suicide gesture recruit was described in terms of the RTS cluster. For the small percentage of controls who were classified as false positives, a follow-up study was planned to determine their subsequent adjustment in the Navy, and to test the validation of designating these recruits as 'high risk'.

AD-A015 770/1GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Psychophysiological Research: Aims and Methods,
Laverne C. Johnson. 1974, 12p Rept no. 74-38
Availability: Pub. in International Jnl. of Psychiatry in Medicine, v5 n4 p565-573 1974.

Descriptors: *Psychophysiology, Consciousness, Reasoning, Homeostasis, Feedback, Sleep, Bioinstrumentation, Reprints.
Identifiers: Cognition, Psychosomatic disorders.

The aims and methods of psychophysiology have shifted from concern over techniques and methodology to interest in the psychophysiology of various states of consciousness and of cognitive processes. Along with the shifts in research interest, there have been changes in instrumentation for data acquisition and data analysis. In its relation to psychosomatic medicine, there appears to be a plateau and further advance may require a shift from emphasis on specific motives and attitudes as correlates of diseases to that of examining the total organism in his total environment with a systems control (homeostasis through feedback) orientation. (Author)

AD-A015 774/3GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Effect of Self-enhanced EEG Alpha on Performance and Mood after Two Nights of Sleep Loss,
David J. Hord, Mary L. Tracy, Ardie Lubin, and Laverne C. Johnson. 5 Nov 74, 9p Rept no. 75-2
ARPA Order-1596
Availability: Pub. in Psychophysiology, v12 n5 p585-590 Sep 75.

Descriptors: *Sleep deprivation, *Electroencephalography, Feedback, Performance(Human), Degradation, Auditory signals, Performance tests, Sleep, Losses, Volunteers, Naval personnel, Anxiety, Perception(Psychology), Memory(Psychology), Arithmetic, Attention, Experimental data, Statistical analysis, Reprints.
Identifiers: *Alpha waves, Mood(Psychology), Reinforcement(Psychology).

This report considers whether the deleterious effects of acute sleep loss on performance and mood can be ameliorated by self-enhanced alpha activity. Fourteen Naval volunteers were divided into an experimental (alpha-contingent auditory feedback) group and a yoked control (pseudofeedback) group. All Ss received feedback plus performance and mood tests during three baseline days and then went for two days and two nights without sleep. Feedback was given for a 1-hr period in the morning and a 1-hr period in the afternoon preceding performance and mood tests. The self-enhanced alpha (experimental) group did produce significantly more alpha during all feedback sessions. Of eleven tests that were sensitive to sleep loss, two performance tests and one mood test showed less sleep-loss damage for the self-enhanced alpha group (significant at the usual univariate .05 level). An anxiety score showed a significant increase for the self-enhanced alpha group following sleep loss. The differences were not significant, however, by the conservative Dunn-Bonferroni multivariate criterion, so the results are not conclusive. Alpha enhancement may help maintain performance that requires continuous attention, such as counting and auditory discrimination, but does not ameliorate the sleep-loss damage to memory and addition.

AD-A015 963/2GA PC$4.25/MF$2.25
Navy Personnel Research and Development Center San Diego Calif
Development of Unit Performance Effectiveness Measures Using Delphi Procedures.
Preliminary rept. 1 Jul 73-30 Jun 74,
Orvin A. Larson, and Stephen I. Sander. Sep 75, 58p Rept no. NPRDC-TR-76-12
See also Rept. no. NPRDC-74-11 dated Jan 74, AD-774 919.

Descriptors: *Delphi techniques, *Performance tests, *Marine Corps personnel, Performance(Human), Effectiveness, Measurement, Field tests, Officer personnel, Tactical warfare, Leadership.
Identifiers: Measures of effectiveness.

A research effort to develop measures of effectiveness for unit performance was undertaken in support of the Marine Corps Tactical Warfare Analysis and Evaluation System (TWAES) requirements. The DELPHI, a technique for eliciting judgements, was used as the primary research approach. Performance evaluation items of both a contextual and response nature were developed. These items were tentatively categorized by unit level and type of performance. (Author)

AD-A015 965/7GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Health and Adjustment of Men at Sea,
E. K. Eric Gunderson. Mar 75, 20p Rept no. 75-19
Contract N00014-72-A-0179-0001
Presented at Research Conference on the Social Psychology of Military Service, 23-25 Apr 75, held at Chicago Univ., Center for Continuing Education.

Descriptors: *Social psychology, *Ship personnel, Enlisted personnel, Health, Adjustment(Psychology), Mental health, Illness, Morbidity, Naval personnel, Personnel retention, Job satisfaction, Statistical analysis, Rates, Naval vessels, Stress(Psychology), Stress(Physiology), Reenlistment, Factor analysis.

Health and adjustment in naval organizations are complex functions of individual characteristics, environmental and organizational influences, and interactions of these sets of varia-

bles. Current studies of men aboard ship are concerned with the development of a social system model to represent behavior in naval organizations and the measurement of physical environments of ships, habitability perceptions of crews, organizational structure, organizational climate, leadership patterns, biographical and military service information, job motivation and satisfaction, and medical and performance criteria at the individual and organizational levels. Preliminary findings indicate that shipboard environmental conditions are correlated with health, satisfaction, performance, and retention of naval personnel. (Author)

AD-A015 999/6GA PC$3.75/MF$2.25
Naval Health Research Center San Diego Calif
Sleep Deprivation in Humans,
Paul Naitoh. 1975, 30p Rept no. 73-32
Availability: Pub. in Research in Psychophysiology, p158-180 1975.

Descriptors: *Sleep deprivation, *Psychophysiology, Performance(Human), Test construction(Psychology), Stress(Physiology), Stress(Psychology), Response(Biology), Respiration, Electroencephalography, Humans, Pulse rate, Reaction(Psychology), Reaction time, Statistical analysis, Reprints.
Identifiers: Heart rate, Subjective responses, Moods(Psychology).

Recent studies were reviewed to summarize some known effects in humans of total, differential and partial sleep deprivations on task performance and subjective feeling tones. An emphasis was placed on describing in detail psychophysiological methods which would be useful for detection of the instances of sleep loss in human subjects. With suggested psychophysiological methods, experimenters could identify, isolate and remove unwanted sleep loss effects from experimental outcome that they could obtain more reliable psychological results than otherwise possible. (Author)

AD-A016 007/7GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Habituation during Sleeping and Waking,
Laverne C. Johnson, Richard E. Townsend, and Michael R. Wilson. 15 Nov 74, 14p Rept no. 75-1
Availability: Pub. in Psychophysiology, v12 n5 p574-584 Sep 75.

Descriptors: *Habituation learning, *Autonomic nervous system, *Sleep, Rapid eye movement in sleep, Consciousness, Response(Biology), Psychophysiology, Humans, Electroencephalography, Awareness, Sensitivity, Acoustic signals, Stimuli, Thresholds(Physiology), Pulse rate, Heart, Reprints.
Identifiers: Wakefulness, Heart rate.

EEG and autonomic habituation were studied during sleep stages 2 and REM, and during awake. Repeated presentations of the same stimulus to the same Ss within sleep stages and when awake permitted evaluation of habituation between tone sets within stage 2, REM and awake, and from sleep to awake. Forty-six Ss were exposed to 800 Hz, 75 dB, 1- or 2-sec tones, presented in sets of 20 tones. During sleep, there was no habituation of the EEG response. Habituation occurred for both finger pulse response (FPR) and heart rate response (HRR) during stage 2, with no evidence of within-stage, between tone set habituation. No significant habituation occurred during REM for HRR or FPR. Evoked skin resistance responses were rare during both stage 2 and REM. In the awake state, HRR was unresponsive but all other variables showed habituation. Tones presented during the night had no effect on the awake response

AD-A016 020/0GA PC$4.25/MF$2.25
Johns Hopkins Univ Baltimore Md Dept of Psychology
Cooperative Versus Conflictive Problem Solving in Three Telecommunication Modes.
Technical rept.,
Gerald D. Weeks, and Alphonse Chapanis. Aug 75, 57p Rept no. TR-1
Contract N00014-75-C-0131

Descriptors: *Behavioral science, *Social communication, *Telecommunication, Cooperation, Conflict, Performance(Human), Problem solving, Voice communications, Closed circuit television, Teletypewriters, Telephone systems, Information exchange, Time, Comparison.
Identifiers: Productivity.

Forty-eight two-person teams communicated through channels simulating various modes of telecommunication: teletypewriter, telephone, and closed-circuit television, and, as a control, face-to-face conversion. Each team was required to solve one of four problems. Two cooperative proplems, a class scheduling and a geographic orientation problem, required the mutual exchange of factual information to reach the unique problem solution. Two conflictive problems, an issue ranking and a budget negotiation problem, were formulated to engender contention between the two team members. Performance was assessed on three classes of dependent measures: time to solution, behavioral measures of activity, and measures of verbal productivity.

AD-A016 021/8GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Cambridge
The Stability of Values in the First Ten Years of the Career.
Final rept.,
Edgar H. Schein. Sep 75, 6p
Contract N00014-67-A-0204-0073

Descriptors: *Careers, *Attitudes(Psychology), Personnel development, Motivation, Management.

Forty-four alumni of the Sloan School of Management classes of 1961, 1962, and 1963 were followed up in 1973 by means of interviews and questionnaires to determine: (1) Career paths followed; (2) value changes observed; and (3) relationships between value changes and career events. Careers were conceptualized in terms of 'career anchors', five such anchors were defined covering all of the cases, and value changes were related to the different career anchors. Implications are that careers are motivated in different ways and organizations must consider these differences in planning career development.

AD-A016 037/4GA PC$5.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
The Relationships Among Managerial Motivation and Influence Styles of USAF Procurement Contracting Officers.
Master's thesis,
Daniel M. Brinkmann, and William M. Denchy. Aug 75, 136p Rept no. SLSR-24-75B

Descriptors: *Supervisors, *Motivation, Performance(Human), Problem solving, Officer personnel, Contracts, Air Force procurement, Questionnaires, Surveys, Theses.

The research examines the relationships between motivation and the selected influence styles of USAF Procurement Contracting Officers (PCOs). Research instruments designed to measure these relationships were distributed to PCOs at Aeronautical Systems Division of Air Force Systems Command. The influence styles were based on French and Raven's typology and consisted of referent, formal, punishment, reward, and expert sources of power. Motivation responses were coded to provide a motivation index for each PCO. Perceived importance of various influence styles was measured relative to both the PCO's subordinates and his work associates.

AD-A016 039/0GA PC$5.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
Air Force Procurement Contracting Officers' Leadership Style: A Comparative Analysis of Measurement Instruments.
Master's thesis,
Lucious E. Bryant, and Janiece B. Bennett. Aug 75, 131p Rept no. SLSR-43-75B

Descriptors: *Leadership, *Air Force personnel, Management, Behavior, Personality, Officer personnel, Motivation, Surveys, Questionnaires, Theses.

The research was aimed towards determining if current leadership measurement instruments are measuring some central construct of leadership. Three measurement instruments were selected for analysis--Ghiselli's Self-Description Inventory, Fleishman's Leadership Opinion Questionnaire and Fielder's Least Preferred Co-worker Scale. Based upon similarities in terminology concerning what they are measuring, it was felt that the results of three instruments would give a consistent description of a respondent's leadership style. A data source of Procurement Contracting Officers (PCOs) was provided for the purpose of determining if certain characteristics of leadership style were predominant among the current PCO work force. The three instruments were administered to 102 PCOs and statistical analysis of the results was performed to determine if relationships existed between the variables measured by each instrument.

AD-A016 057/2GA PC$3.75/MF$2.25
Naval Health Research Center San Diego Calif
Research on the Military Family: An Assessment,
Hamilton I. McCubbin, Barbara B. Dahl, and Edna J. Hunter. 11 Mar 75, 33p Rept no. 75-24
Presented at Conference on the Social Psychology of Military Service, Chicago, Ill., 23-25 Apr 75.

Descriptors: *Military dependents, *Attitudes(Psychology), Children, Human relations, Mobility, Behavior, Military personnel, Adjustment(Psychology), Emotions, Prisoners of war, Stress(Psychology), Social welfare.

Social and psychological studies conducted on military families during the past four decades were categorized and reviewed. The historical antecedents of family research in the military were critiqued. Research carried out on the military family were categorized: mobility, child adjustment and development, adjustment to separation, family reunion and reintegration, adjustment to loss, families in transition, and services to families under stress. The limitation but importance of family research in the military is emphasized; the study of the military family is an important approach to understanding and predicting performance, health and retention of military personnel.

AD-A016 250/3GA PC$3.25/MF$2.25
Institute for Research State College Pa Div of Psychobiology
Behavioral Enhancement.
Final rept. 1 Mar 73-31 Aug 75,
Paul M. Hurst, and Sallyann K. Bagley. 31 Aug 75, 18p
Contract N00014-73-C-0217

Descriptors: *Sleep, *Hypnotics and sedatives, *Conditioned response, Feedback, Electromyography, Drugs, Experimental data, Relaxa-

tion(Physiology), Response(Biology), Humans, Respiration.
Identifiers: *Biofeedback, Flurazepam.

The principal goal in this 30-month period was to facilitate voluntary control over sleep. The initial phase employed analog tonal biofeedback of integrated submental EMG potential to facilitate relaxation. A pilot study was conducted in which EEG-determined Stage 2 sleep latency was compared within subjects between 'tone on' and 'tone off' conditions. This was followed by a controlled study in which one group of subjects received tonal biofeedback and the other did not. Neither study indicated any beneficial results from biofeedback on either relaxation or sleep latency. A third study was conducted in which a sedative-hypnotic drug (flurazepam) was used to evoke sleep in the attempt to achieve voluntary control of a classically conditioned response. Comparison of post-drug with pre-drug trials reveals a more rapid facilitation of sleep onset than would be expected on the basis of practice along, but does not conclusively demonstrate that classical conditioning was responsible.

AD-A016 261/0GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Comparative Analysis of Organizational Climate Existing in System Program Offices in Different Phases of the Weapon System Acquisition Process.
Master's thesis,
Julius C. Larson, Jr., and Peter J. Ruppert. Aug 75, 114p Rept no. SLSR-1-75B

Descriptors: *Organization theory, *Perception(Psychology), *Behavioral science, Performance(Human), Department of Defense, Weapon systems, Acquisition, Surveys, Variations, Statistical processes, Logistics, Organizations, Theses, Hypotheses.
Identifiers: *Organizational climate.

Organizational climate is a relatively new concept that has come upon the social research scene. It can be conceptualized as the sum of all the different perceptions individuals in an organization have with respect to the organization. This study attempted to measure and assess the prevailing organizational climate in System Program Offices (SPOs) in different phases of the weapon system acquisition process. The researchers were interested in determining if organizational climate differed in different phases of weapon system acquisition.

AD-A016 265/1GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Comparative Analysis of Leadership Styles Existing in System Program Offices in Different Phases of the Weapon System Acquisition Life Cycle.
Master's thesis,
Jerry W. Coggeshall, and Juan G. Jasso. Aug 75, 119p Rept no. SLSR-6-75B

Descriptors: *Leadership, *Supervisors, Management planning and control, Weapon systems, Life cycles, Air Force personnel, Requirements, Personality, Behavior, Surveys, Questionnaires, Theses.
Identifiers: Managers.

The objective of this research was to determine if the leadership styles of managers and specialists working in United States Air Force weapon system program offices differ among the phases of the weapon system acquisition life cycle. The research population consisted of military and civilian managers and specialists working in thirteen weapon system program offices, each identified with a particular phase of the weapon system acquisition life cycle. For purposes of comparison, phases of the weapon system acquisition life cycle were grouped into conceptual/validation, full-scale development, and production/deployment categories. The Leadership Opinion Questionnaire (LOQ), which measures leadership dimensions of Consideration and Structure, was the instrument through which data were obtained. Statistical analyses were based upon the LOQ scores of 182 respondents from the three categories: Conceptual/validation - 22; full-scale development - 80; production/deployment - 80.

AD-A016 273/5GA PC$3.75/MF$2.25
California Univ Los Angeles School of Engineering and Applied Science
Group Decision Analysis.
Interim technical rept.,
N. C. Dalkey. Aug 75, 47p Rept no. UCLA-ENG-7571
Contract N00014-69-0200-4056, ARPA Order-2841

Descriptors: *Decision making, *Decision theory, *Group dynamics, Uncertainty, Scale, Probability, Theorems, Mathematical models, Performance(Human).
Identifiers: Delphi technique, Judgment(Psychology).

Delphi, as a procedure for aggregating judgments under certainty, has suffered from the lack of an underlying theoretical framework, especially one that relates group estimates to decision processes. It is shown that consistent group preference functions can be formulated by the use of anchored scales, i.e., individual preference scales with fixed reference objects. A justification for the use of group probability judgments can be made, based on a family of theorems to the effect that the accuracy of a group judgment is always greater than (or at worst equal to) the average accuracy of the individual judgments.

N75-30777/7GA PC$7.00/MF$2.25
Joint Publications Research Service, Arlington, Va.
Higher Nervous Activity of Man: Motivational-Emotional Aspects.
P. V. Simonov. Aug 75, 187p NASA-TT-F-16453
NASA ORDER W-13183
Tran-Transl. Into English of the Book "Vysshaya Nervnaya Deyatelnost Cheloveka: Motivatsionno-Emotsionalnyye Aspekty" Moscow, Nauka Press, 1975 p 1-175.

Descriptors: *Human behavior, *Mental performance, *Psychological factors, Brain, Emotions, Motivation, Reinforcement (Psychology), Sensory feedback.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30788/4GA PC$8.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
Psychophysical Models for Signal Detection with Time Varying Uncertainty.
Ph.D. Thesis.
E. Gai. Jan 75, 286p NASA-CR-137734
Contract NGR-22-009-733

Descriptors: *Decision making, *Human behavior, *Operator performance, *Signal detection, Mathematical models, Probability theory, Psychophysiology, Strategy.

For abstract, see STAR 1321

5K. Sociology

AD-A016 224/8GA PC$7.50/MF$2.25
Control Analysis Corp Palo Alto Calif
Costs and Retention Impacts of the Navy's CONUS Recreation Program.
Final rept. 1 Jan-31 Aug 75,
Atam P. Lalchandani, Thomas H. Humphreys, Richard C. Morey, David P. Snyder, and Anthony B. de Andrade. 30 Sep 75, 238p
Contract N00014-75-C-0628
See also AD-A016 225.

Descriptors: *Recreation, *Naval shore facilities, *Naval planning, Cost effectiveness, Fringe benefits, Assessment, Classification, Economic models, Personnel retention, Motivation.

This study is an evaluation of the benefits and costs associated with the Navy's shore-based Recreation Program. The evaluation is achieved by determining the cost effectiveness of the Overall Recreation Program as well as that for the fourteen individual Recreation Categories. A significant by-product of the cost-effectiveness has been the estimation of income from and costs (operating as well as capital costs) of individual Recreation Categories. The results are based on extensive information gathered from over 11,000 active duty eligible users as well as the managers of the Recreation Program at 16 diverse Navy Installations in CONUS. The Recreation Program has been evaluated not only in terms of its benefits to the Navy individual and dependents but also with respect to its overall impact on the Navy in terms of maintaining retention rates.

AD-A016 225/5GA PC$5.75/MF$2.25
Control Analysis Corp Palo Alto Calif
Costs and Retention Impacts of the Navy's CONUS Recreation Program. Appendices.
30 Sep 75, 128p
Contract N00014-75-C-0628
See also AD-A016 224, and AD-A016 226.

Descriptors: *Recreation, *Naval shore facilities, *Naval planning, Cost effectiveness, Classification, Data bases, Inventory, Personnel management, Questionnaires, Cost analysis.

The second document in a two-part report describes the recreation categories in the Navy CONUS program, presents questionnaire survey forms for obtaining Naval personnel opinions, and gives cost and data management information.

AD-A016 226/3GA PC$4.75/MF$2.25
Control Analysis Corp Palo Alto Calif
Costs and Retention Impacts of the Navy's CONUS Recreation Program. Individual Installation Information.
30 Sep 75, 78p
Contract N00014-72-C-0628
See also AD-A016 225.

Descriptors: *Recreation, *Naval shore facilities, *Naval planning, Naval personnel, Finance, Cost effectiveness, Personnel retention, Statistical data, Economic models, Classification, Salaries, Cost analysis.

The information contained in this volume pertains to each of the individual installations. The information includes population breakdown by pay-grade by duty assignment (afloat and ashore), operating income, expense, and capital expense information in tabular form, rankings of cost-effectiveness ratios, and a summary table of the increase in annual retention costs resulting from closing each of the recreation categories at each base.

COM-75-11406/6GA PC$3.25
Rhode Island Univ., Kingston. Dept. of Resource Economics.
Some Problems in Estimating the Demand for Outdoor Recreation,
K. E. McConnell. May 75, 8p Marine Reprint-42, Contrib-1590 NOAA-75090804
Grant NOAA-04-3-158-3
Also pub. as Rhode Island Agricultural Experiment Station, Contrib-1590. Pub. in American Jnl. of Agricultural Economics, v57 n2 May 75.

Descriptors: *Recreation, *Demand(Economics), Economic analysis, Time, Prices, Income, Units of measurement, Travel, Estimating.
Identifiers: *Outdoor recreation, Sea Grant program, Utility theory, Reprints.

The purpose of this paper is to derive recreation demand functions consistent with utility maximization to address specific issues in empirical research. The paper demonstrates explicitly the practical difficulties implied by the assumptions of utility maximization. It considers three specific issues in outdoor recreation demand: (a) the value of time as a cost of participating in outdoor recreation, (b) the logical units of measuring via the travel cost method, and (c) the appropriate functional form of the outdoor recreation demand function involving price and income variables. Three basic conclusions are derived by the author.

N75-30636/5GA PC$4.25/MF$2.25
Hidalgo (John U.), Inc., Metaire, La.
Research Investigations in and Demonstrations of Remote Sensing Applications to Urban Environmental Problems.
Final Report.
J. U. Hidalgo. 25 Jul 75, 67p NASA-CR-143924
Contract NAS8-30882

Descriptors: *Environment protection, *Remote sensors, *Urban planning, *User requirements, Land use, Landsat satellites, Project planning, Traffic control.

For abstract, see STAR 1321

PB-244 785/2GA PC$6.25/MF$2.25
New Jersey State County and Municipal Government Study Commission, Trenton.
Housing and Suburbs: Fiscal and Social Impact of Multifamily Development.
Rept. no. 9 (Final),
Allan Mallach, Stephen A. Decter, and Thomas Norman. Oct 74, 161p*

Descriptors: *Residential buildings, *Community development, *Local government, *New Jersey, Apartment buildings, Urbanization, Financial management, Taxes, Expenses, Municipalities, Land use, Urban planning.
Identifiers: Housing studies, High rise apartments, Suburban areas, Housing characteristics, Social effect.

The report summarizes the findings of surveys of 100 local elected officials, 4,000 households and numerous case studies of single family, townhouse garden apartment and highrise projects on the impacts of various types of housing on local government budgets. In addition to providing findings on the cost revenue characteristics of various housing types it provides information on their social and political characteristics. The report includes recommendations for development of state programs that would help local governments carry out balanced housing development at the community level.

PB-245 282-SET/GA PC$21.00
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
Analysis of Selected Census and Welfare Program Data to Determine Relation of Household Characteristics, Housing Market Characteristics, and Administrative Welfare Policies to a Direct Housing Assistance Program. Volume I.
Jul 74, 688p-in 3v
Set includes PB-245 283 thru PB-245 285.

No abstract available.

PB-245 283/7GA PC$7.00/MF$2.25
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
Analysis of Selected Census and Welfare Program Data to Determine Relation of Household Characteristics, Housing Market Characteristics, and Administrative Welfare Policies to a Direct Housing Assistance Program.
Final rept.
31 Jul 74, 176p
Contract HUD-H-1876
Paper copy also available in set of 3 reports as PB-245 282-SET, PC$21.00.

Descriptors: *Social welfare, *Project planning, *Residential buildings, *Government policies, National government, Cash basis, Allowances, Management, Leasing.
Identifiers: *Federal . assistance programs, *Housing allowance programs, *Housing studies, *Cash assistance, Rental housing.

Three volumes form a series of technical papers which provide the basis for the summary report entitled Implications for a Direct Cash Assistance Program for Housing: An Analysis of Census Data and Welfare Program Experience. A number of the administrative issues that would be involved in the implementation of a direct cash assistance program for housing are discussed based upon past studies and new information obtained concerning the various welfare assistance programs. Also included are studies of housing deprivation and both static and simulation analyses of the housing market effects of various rent-and-income-conditioned direct cash assistance payment plans. Volume One covers cash assistance planning, housing deprivation, the permanent income hypothesis, source of income and rental housing demand, housing markets, and home ownership among low-income households.

PB-245 284/5GA PC$9.25/MF$2.25
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
Analysis of Selected Census and Welfare Program Data to Determine Relation of Household Characteristics, Housing Market Characteristics, and Administrative Welfare Policies to a Direct Housing Assistance Program. Volume II.
Final rept.
31 Jul 74, 318p
Contract HUD-H-1876
Paper copy also available in set of 3 reports as PB-245 282-SET, PC$21.00.

Descriptors: *Social welfare, *Project planning, *Residential buildings, *Government policies, National government, Cash basis, Allowances, Management, Probability theory, Statistical analysis.
Identifiers: *Federal assistance programs, *Housing allowance programs, *Cash assistance, Conditional probability, Alternatives.

Volume Two of a three volume discussion of direct cash assistance for low income family housing deals with conditional probability of housing deprivation for urban renters, and the equilibrium analysis of alternative housing allowance payments.

PB-245 285/2GA PC$7.00/MF$2.25
Harvard-MIT Joint Center for Urban Studies, Cambridge, Mass.
Analysis of Selected Census and Welfare Program Data to Determine Relation of Household Characteristics, Housing Market Characteristics, and Administrative Welfare Policies to a Direct Housing Assistance Program. Volume III.
Final rept.
31 Jul 74, 194p
Contract HUD-H-1876
Paper copy also available in set of 3 reports as PB-245 282-SET, PC$21.00.

Descriptors: *Social welfare, *Residential buildings, *Government policies, National government, Cash Basis, Leasing, Allowances, Management, Systems analysis.
Identifiers: *Federal assistance programs, *Housing allowance programs, *Housing studies, *Cash assistance, *Rental housing.

Volume Three of a three-part study of cash assistance for low income family housing deals with the housing of welfare recipients, the administrative issues of public transfer programs, integration of a housing allowance program into the social welfare system, and some implications of the concept.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A015 991/3GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Effects of Insulin, Tolbutamide, and Glucagon on Activities of Jejunal Carbohydrate-Metabolizing Enzymes in Humans.
Final rept.,
Edward G. Lufkin, O. David Taunton, Fred B. Stifel, Norton S. Rosenweig, and Louis Hagler.
11 Mar 75, 7p Rept no. Lair-76-001
Availability: Pub. in Metabolism, v24 n8 p923-928 Aug 75.

Descriptors: *Insulin, *Enzymes, Humans, Diet, Carbohydrates, Ingestion(Physiology), Injections(Medicine), Reprints.
Identifiers: Tolbutamide, Glucagon.

In normal men insulin increases the activity of jejunal pyruvate kinase and hexokinase, decreases the activity of fructose diphosphatase and had no effect on fructose diphosphatate aldolase, while glucagon had opposite effects. Tolbutamide acted the same as insulin with the exception that it increased fructose diphosphatate aldolase activity. (Author)

AD-A015 996/2GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
The Effect of Agitation on In Vitro Metabolism of Erythrocytes Stored in CPD-Adenine.
Final rept. Mar-Apr 75,
T. A. Bensinger, J. Metro, and E. Beutler. 26 Aug 74, 7p Rept no. LAIR-76-008
Availability: Pub. in Transfusion, v15 n2 p140-143 Mar-Apr 75.

Descriptors: *Blood, *Mixing, *Erythrocytes, Blood chemistry, Organic phosphorus compounds, Glycerols, Glucose, Adenosine phosphates, Metabolism, In vitro analysis, Reprints.
Identifiers: Diphosphoglycerates.

Agitation of blood stored in plastic containers has been reported to lead to improved post-transfusion survival and it has been found that, in some media, agitation has improved erythrocyte 2,3-diphosphoglycerate (2,3-DPG) levels. Using CPD II media (CPD with 277.5 mM glucose and 2.04 mM adenine), improvement in levels of adenosine triphosphage, 2,3-DPG or glucose in whole blood under various agitation conditions when compared with the nonagitated control was not evident. The 2,3-DPG level was moderately improved through 28 days in the 90 per cent hematocrit packed erythrocytes but the results were not considered to be significantly beneficial to warrant agitation. Thus, the application of agitation to the CPD II blood storage system was of no great benefit in improving metabolic intermediate levels.

AD-A016 197/6GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Reduction and Reoxidation of the Disulphide Bonds of Pepsinogen.
Medical research progress rept.,
V. Frattali, R. F. Steiner, D. B. S. Millar, and H. Edelhoch. 1963, 5p
Availability: Pub. in Nature, v199 n4899 p1186-1187, 21 Sep 63.

Descriptors: *Pepsins, *Precursors, *Biochemistry, *Reduction(Chemistry), *Oxidation, Sulfides, Chemical bonds, Electrophoresis, Reprints.
Identifiers: *Pepsinogen.

Both native and re-oxidized pepsinogen were subjected to starch-gel electrophoresis for 4 h at 4 degrees using a 7.0 mM tris-citrate buffer, pH 8.4, with subsequent development of the gel slab by amino black dye. The former showed one well-defined zone with two minor components which migrated behind the major zone. Re-oxidized material gave the same major band with a broad ill-defined trailing region, the front of which moved at a rate intermediate to the two lesser components found in the native protein sample. These experiments indicate that the tertiary and most of the secondary structure of pepsinogen can be disrupted without greatly affecting the ability of polypeptide chain to recover some of its structure and possibly as a consequence, some of its activity. At present, however, it would be premature to assert that the recovered active molecule is identical in all respects to native pepsinogen. (Author)

AD-A016 198/4GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Ultraviolet Fluorescence of Proteins: Influence of Conformation and Environment.
Medical research progress rept.,
R. F. Steiner, R. E. Lippoldt, H. Edelhoch, and V. Frattali. 1964, 13p
Availability: Pub. in Biopolymers Symposia, n1 p355-366 1964.

Descriptors: *Proteins, *Fluorescence, Ultraviolet radiation, Organic solvents, Biochemistry, Tryptophan, Tyrosine, Polymers, Conformity, Reprints.
Identifiers: Conformation.

The influence of variations in solvent composition upon the ultraviolet fluorescence of tryptophan-containing proteins is strongly dependent upon their conformation. In general, the response to the addition of neutral solvent increases under conditions where the organized structure is lost. The intensity of fluorescence is in general altered by conformational changes and may be used to monitor such changes. Rate constants computed in this way agree with those obtained from other criteria. Three examples are given. (Author)

PB-245 261/3GA PC$6.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge.
Development of Enzyme Systems and Technology for Large-Scale Synthesis of Useful Products.
Progress rept. 15 Jan-15 Dec 74,
1 Jan 75, 153p NSF/RA/T-75/023
Grant NSF-GI-34284

Descriptors: *Biosynthesis, *Enzymes, *Antibiotics, *Bacitracin, Adenosine phosphates, Cost estimates, Capitalized costs, Production, Operating costs, Purification, Bacteria, Catalysis, Microbiology.
Identifiers: *Enzyme technology, *Gramicidin S, Synthetases, Kinases/acetate, Kinases/adenylate, Bacillus brevis, *Adenosine tetrahydrogen phosphates, Immobilized enzymes.

In the present report period the authors' interdisciplinary enzyme group has progressed toward the objectives initially set forth in their proposal. There are two primary objectives within the overall scope of the project. These are the total enzymatic synthesis of antibiotics (gramicidin S and bacitracin A) and the enzymatic regeneration of ATP from AMP. Within these broad areas, there are many subtopics where interdisciplinary and collaborative research efforts have proven to be invaluable.

6C. Biology

AD-A015 970/7GA PC$3.75/MF$2.25
Lovelace Foundation for Medical Education and Research Albuquerque N Mex
The Relationship between Fish Size and Their Response to Underwater Blast.
Topical rept.,
John T. Yelverton, Donald R. Richmond, William Hicks, Heith Saunders, and E. Royce Fletcher. 18 Jun 75, 40p DNA-3677T
Contract DNA001-74-C-0120

Descriptors: *Fishes, *Tolerances(Physiology), *Underwater explosions, Blast, Vulnerability, Survival(General), Response(Biology), Shock waves, Mortality rates, Exposure(Physiology), Predictions, Sizes(Dimensions).

Fish were exposed to underwater blasts in an artificial pond, 220 x 150 ft, that was 30 ft deep. The underwater-blast impulse levels required for 50-percent mortality, 1% mortality, and no-injuries were determined for eight species of fish. There was good correlation between the LD sub 50 impulse and the body weight of the fish. These ranged from 1.7 psi.msec for 0.02-g guppy fry to 49.5 psi.msec for 744-g carp. No difference was detectable in the underwater blast response of fish that had ducted swimbladders and those that had nonducted swimbladders. Application of the results of this study to predicting the response of fish to underwater explosions was discussed.

AD-A016 168/7GA PC$3.25/MF$2.25
Smithsonian Institution Washington D C
Medical Entomology Project.
Rept. no. 1 (Annual), 1 Jun 74-31 May 75,
E. L. Peyton. 12 Sep 75, 25p
Contract DAMD17-74-C-4086

Descriptors: *Entomology, *Arthropoda, *Disease vectors, Insects, Arthropod borne diseases, Anopheles, Culex, Aedes, Culicidae, Infectious diseases, Ecology, Taxonomy, Diptera.
Identifiers: *Medical entomology, Tabanidae, Mosquitoes.

The Medical Entomology Project (MEP) conducts biosystematic research on arthropods of medical importance to the Army. MEP fulfills this requirement by performing biosystematic studies on important groups of vectors such as anopheline mosquitoes and Culex species involved in virus transmission, providing information on potential vectors for the guidance of military field research teams and other agencies and preparing monographs and technical papers which summarize data on the ecology, taxonomy and medical importance of arthropod vectors in various regions of the world. In addition, MEP performs curation and research on the national collection of mosquitoes at the National Museum of Natural History, Smithsonian Institution.

COM-75-11378/7GA PC$4.25/MF$2.25
National Marine Fisheries Service, Gloucester, Mass. Atlantic Fishery Products Technology Center.
A Study: Expanded Processing Techniques, Production Costs and Market Survey of Underutilized Fish Species.
Technical assistance rept.,
J. M. Mendelsohn. May 74, 60p* EDA-75-05
Grant EDA-01-6-09131-2

Descriptors: *Fishes, *Economic development, *Market research, Abundance, Food processing, Food consumption, Food preparation, Food storage, Drying, Feasibility, Acceptability.
Identifiers: *Merluccius bilinearis, *Market surveys, Fish products, Technical assistance, *Fish cakes.

The program was carried out by the Atlantic Fishery Products Technology Center (AFPTC), National Marine Fisheries Service (NMFS) under a one-year contract with the Economic Development Administration (EDA), U.S. Department of Commerce. The contract called for implementing the results of a previous study (A Study to Develop New Products from Whiting or Other Underutilized Species,) in which new products having commercial potential were prepared on a laboratory scale from seasonally abundant and underutilized whiting (Merluccius bilinearis) and similar species.

COM-75-11382/9GA PC$3.75/MF$2.25
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
Age and Size Composition of the Atlantic Menhaden, 'Brevoortia tyrannus', Purse Seine Catch, 1963-71, with a Brief Discussion of the Fishery.
Special scientific rept. - Fisheries series,
William R. Nicholson. Jun 75, 36p NOAA-TR-NMFS-SSRF-684 NOAA-75090901

Descriptors: *Marine fishes, *Fishing grounds, *Fishing, Age, Size determination, Tables(Data), Sex, Fisheries, Seasonal variations, Coasts, Sampling, Chesapeake Bay, Cape Hatteras, Florida, North Atlantic Ocean.
Identifiers: *Brevoortia tyrannus, Fish harvesting.

The catch of Atlantic menhaden, Brevoortia tyrannus, estimates of numbers of fish caught by age, fishing effort, age and size distribution, and changes in the fishery are summarized and briefly discussed for the five areas of the Atlantic coast of the United States for 1963-71. Appended are tables of seasonal length frequency distributions and mean lengths by age and port and tables of monthly mean lengths by sex, age, and port. The purse seine fishery declined after 1962. North of Chesapeake Bay, plants closed or reduced fishing as fish became scarce. Of eight plants that processed menhaden in 1962 only two operated in 1971. The catch and catch per unit of effort in Chesapeake Bay declined as effort increased. South of Cape Hatteras, N.C. the fishery, which had been small compared to the fishery in other areas, showed little change. The average age and size of fish in the total catch declined as the fishery north of Chesapeake Bay, which mainly caught older and larger fish, declined. Age-1 and -2 fish, which constituted most of the catch from Florida to Chesapeake Bay, increased in average length and weight.

COM-75-11389/4GA PC$3.75/MF$2.25
National Marine Fisheries Service, Washington, D.C. Div. of Economic and Marketing Research.
Shellfish: Market Review and Outlook.
Current economic analysis S-33,
Richard W. Surdi, and Roger W. Hutchinson. Aug 75, 28p* NOAA-SSOLB-33 NOAA-75091706

Descriptors: *Shellfish, *Fishes, *Market research, Surveys, Imports, Shrimps, Lobsters, Crabs, Oysters, Crustacea, Prices, Inventories, Supply(Economics), Food consumption, Marketing.
Identifiers: Scallops, Fishing industry.

The report gives a market review and outlook for the shellfish industry. Reduced imports during the first half of 1975 lowered overall sup-

plies of some, but not all major shellfish items. A 22 percent cutback in shrimp imports, combined with a lighter catch, resulted in 14 percent less shrimp for distribution than was the case during the same period a year ago. With inventories being drawn down, there were, in fact, instances of acute shortages during the period. However, there were significantly improved supplies of both American lobster and spiny lobster. Generally low supplies caused prices of most shellfish products to rise during the first half. After adjustment for seasonal fluctuations, prices for each major shellfish product, with the exception of American lobster, steadily rose throughout the first half of 1975. Consumption of most shellfish products was above 1974 levels. The outlook is that the shellfish market condition will remain essentially unchanged during the second half of the year. Supplies of shrimp, scallops, and oysters will continue to be down and may limit consumption somewhat. Prices, as a result, will likely strengthen.

COM-75-11401/7GA PC$3.25/MF$2.25
Guam Div. of Fish and Wildlife, Agana.
A Study to Determine the Aquaculture Potentials of Guam.
Completion rept. 1 Jul 72-30 Jun 75,
William J. Fitzgerald, Jr. Jul 75, 17p NOAA-75091710

Descriptors: *Fisheries, *Aquaculture, *Economic development, *Guam, Marine fishes, Shellfish, Climate, Feasibility, Waterways(Watercourses), Eels, Carp, Fresh water fishes, Ponds, Shrimps, Oysters, Construction.
Identifiers: *Fishing industry, Commercial fishing.

The report describes a study done to determine the aquaculture potentials of Guam. The program was undertaken with the goal of testing the economic feasibility of culturing fish for commercial production on Guam. The study revealed that Guam is ideally situated for a highly productive aquaculture industry. The high year round temperature provides a climate that is conductive to a rapid growth rate in many species. The alleviation of non growth periods in more temperate climates brought about by over-wintering low temperatures has been a main factor. Utilization of Guam's natural waterways and suitable agriculture land for a very productive means of producing high quality protein would benefit Guam's economy. The report deals specifically with construction of earthen fish ponds; pond management; eel, shrimp, and oyster production; and secondary crop species.

COM-75-11402/5GA PC$3.25
Rhode Island Univ., Kingston. Graduate School of Oceanography.
Diets of Juvenile Atlantic Menhaden ('Brevoortia tyrannus') in Three Estuarine Habitats as Determined from Fatty Acid Composition of Gut Contents,
H. Perry Jeffries. May 75, 9p Marine Reprint-40 NOAA-75090803
Grant NOAA-04-3-158-3
Pub. in Jnl. of the Fisheries Research Board of Canada, v32 n5 May 75.

Descriptors: *Marine fishes, *Diets, *Food habits, Animal nutrition, Food analysis, Fatty acids, Zooplankton, Growth, Estuaries, Food supply, Adaptation.
Identifiers: Reprints, Sea Grant program, *Brevoortia tyrannus.

The results of the study of the diets of juvenile Atlantic menhaden (Brevoortia tyrannus) show that they feed on zooplankton and particulate organic matter, but the importance of each material in the diet cannot be visually determined, because food is ground to an amorphous paste in the fish's gizzard-like stomach. During early digestion in the anterior alimentary canal, fatty acids do not appear to change significantly, at least with respect to relative concentrations of saturated and unsaturated groups. Because zooplankton and particulate organic matter have markedly different fatty acid compositions, a hypothetical mixture of the two components can be calculated that best accounts for the observed fatty acid distributions of gut contents. Decreasing reliance on zooplankton, from bay through river to marsh, probably reflects resource abundances in three habitats and demonstrates adaptability of juvenile menhaden to different food supplies.

COM-75-11407/4GA PC$5.25/MF$2.25
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
Ocean Distribution of Stocks of Pacific Salmon, 'Oncorhynchus spp'., and Steelhead Trout 'Salmo gairdneril', as Shown by Tagging Experiments - Charts of Tag Recoveries by Canada, Japan, and the United States, 1956-1969.
Technical rept.,
Robert R. French, Richard G. Bakkala, and Doyle F. Sutherland. Jun 75, 101p NOAA-TR-NMFS-SSRF-689 NOAA-75091705

Descriptors: *Salmon, *Trout, *North Pacific Ocean, Monitoring, Spatial distribution, Fishing grounds, Marking, Canada, Japan, United States.
Identifiers: Oncorhynchus, Salmo gairdnerii, Fish stocks.

The report gives the results of extensive tagging experiments conducted by member nations of the International North Pacific Fisheries Commission-Canada, Japan, and the United States-in offshore waters of the North Pacific Ocean. The purpose of these experiments was to investigate the ocean distribution of stocks of Pacific salmon, Oncorhynchus spp. This effort has resulted in the recovery of 15,215 tags including steelhead trout, Salmo gairdnerii, from inshore and high-seas areas. To provide a reference by which the offshore distribution of the various stocks can be readily seen as shown by tagging results through 1969, the tagging locations at sea are illustrated for each species and recovery area.

CONF-750642-1 PC$5.00/MF$2.25
Puerto Rico Nuclear Center, Mayaguez.
Survey of Fishes from Barrio Islote on the North Coast of Puerto Rico.
J. J. Kimmel. 1975, 38p

Descriptors: (*Fishes, *Population dynamics), (*Puerto rico, Fishes), Abundance, Aquatic ecosystems, Coastal waters, Distribution, Eggs, Regional analysis, Seasonal variations.

For abstract, see NSA 32 08, number 19687.

N75-30773/6GA PC$7.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Comparative Anatomy of the Audio-Vestibular Organ.
H. M. Deburlet. Sep 75, 239p NASA-TT-F-16456
Contract NASW-2483
Tran-Transl. Into English from Handb. Der Vergleichenden Anat. Der Wirbeltiere, Herausgegeben von Weiland Lois Bolk (West Germany), V. 2, 1934 p 1293-1432.

Descriptors: *Anatomy, *Vertebrates, *Vestibules, Audiology, Endolymph, Labyrinth, Middle ear, Semicircular canals.
Identifiers: Translations.

For abstract, see STAR 1321

6E. Clinical Medicine

AD-A015 639/8GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Effects of Shipboard Environmental Conditions on Health,
William M. Pugh, and E. K. Eric Gunderson. 1974, 22p Rept no. 74-18

Descriptors: *Morbidity, *Ship personnel, Military personnel, Shipboard, Environments, Predictions, Habitability, Organization theory, Social psychology.
Identifiers: Environmental health.

Variations in illness rates for three types of U.S. Navy ships were related to differences in perceived physical characteristics of the ships. The Habitability Questionnaire (HQ) described shipboard living and working conditions, and scoring keys were developed to predict independent portions of total illness scores -- between-ship illness scores and within-ship illness scores. The correlations of HQ scores with the between-ship illness criterion partially explained ship differences that accounted for variations in illness rates. Predictive equations reflecting shipboard living conditions were cross validated and revealed that total illness scores. These results indicated that structural and organizational characteristics of the ships were important influences on illness rates.

AD-A015 816/2GA PC$3.75/MF$2.25
Oklahoma Univ Health Sciences Center Oklahoma City
Hypoglycemic Effects of Endotoxin in Eviscerated Dogs.
Technical rept.,
Marvin D. Peyton, Lerner B. Hinshaw, Lazar J. Greenfield, and Ronald C. Elkins. 10 Sep 75, 21p Rept no. TR-100
Contract N00014-68-A-0496

Descriptors: *Hypoglycemia, *Endotoxic shock, Insulin, Glucose, Blood chemistry, Metabolism, Physiology, Pathology, Dogs, Experimental data.
Identifiers: Pathophysiology, Animal models.

Terminal endotoxin shock in the canine is associated with profound hypoglycemia. In order to evaluate the intricacies of this response during endotoxin shock, serum glucose and insulin levels were measured in eviscerated dogs with ablation of pancreatic and hepatic function. The response of eviscerated dogs with absent pancreatic and hepatic function is compatible with insulin-independent peripheral tissue catabolism of glucose and an increased lactate/pyruvate ratio suggests anaerobic metabolism. Increased survival in animals administered exogenous glucose indicates reversible, fuel dependent changes of peripheral tissue metabolism. Since hyperglycemia has been a predominant finding in clinical endotoxin shock, species differences are emphasized but perhaps closer scrutiny of the terminal stages of clinical endotoxin shock would be more compatible with this experimental model.

AD-A015 890/7GA PC$3.25/MF$2.25
Army Medical Intelligence and Information Agency Washington D C
Experience in Wartime Surgical Treatment of Traumatic Aneurysms (Ratno-Hirurka Iskustva Traumaticnim Aneruzmama),
V. Subbotic. 16 Sep 75, 14p Rept no. MIIA-K-5844
Trans. of Srpski Arhiv za Celokupno Lekarstvo (Yugoslavia) v20 n1 p1-13 Jan 14.

Descriptors: *Cardiovascular diseases, *Surgery, Surgical techniques, Therapy, Trauma, Blood vessels, Weapons effects, Wounds and injuries, Translations, Yugoslavia.
Identifiers: *Aneurysms.

Presented is a discussion on surgical techniques used in repairing major blood vessels in ballistic wounds.

AD-A015 905/3GA PC$4.25/MF$2.25
Letterman Army Medical Center San Francisco Calif
Present Concepts in Internal Medicine. Nephrology Symposium 1975,
Richard E. Chojnacki, and Lottie B. Applewhite. 1975, 68p
See also report dated Apr 73, AD-760 930.

Descriptors: *Meetings, *Kidneys, Kidney diseases, Nephritis, Sodium, Excretion, Ultrasonics, Therapy, Potassium, Deficiencies.
Identifiers: *Nephrology, Hemodialysis, *Urologic diseases, Hypokalemia.

Contents:
Hemodialysis in the home;
Diuretic-induced hypokalemia;
Lupus nephritis;
The control of renal sodium excretion;
Application of ultrasound in nephrology.

AD-A015 956/6GA PC$4.25/MF$2.25
Naval Academy Annapolis Md
An 'Analysis of the Relationship of Neurological Activity to Physical Exertion.
Research rept.,
Charles A. Hill. 22 May 75, 55p Rept no. USNA-TSPR-69
Report on a Trident Scholar Project.

Descriptors: *Electroencephalography, *Exercise(Physiology), *Neurology, Brain, Waves, High frequency, Naval personnel, Physical fitness, Performance tests, Performance(Human), Anxiety, Reduction, Correlation techniques.
Identifiers: Harvard step tests, Throughput latency method, Midshipmen.

This study demonstrated some of the effects physical exertion has on Neurological activity. The research was made at the U.S. Naval Academy and sampled 77 midshipmen. Spectral analysis of EEG recordings made before and after exercise showed a significant reduction in high frequency content - greater than 60 Hz - for all of 77 midshipmen, who underwent the 'Harvard Step Test'. -- Since other studies show that high frequency content in brain waves is related to anxiety, these results suggest that exercise can temporarily reduce anxiety. Cross correlation was used to measure the time delay between a visual sensory stimulus and the resulting evoked potential as measured by scalp mounted electrodes for both - the right and left - hemispheres before and after exercise. This time delay - termed 'Throughput latency' or TPL - was unaffected by physical exertion, and or physical fatigue. Correlations were then run between the grade point averages (QPR) of the 77 midshipmen and their TPL's as well as their verbal, math and combined college board scores. -- The results indicated that throughput latency is as good an indicator of college performance as measured by QPR as are the college board scores. (Author)

AD-A015 961/6GA PC$4.25/MF$2.25
Naval Academy Annapolis Md
A Determination of Neurological Differences Between Individuals as Related to their Psychological/Motivational Differences.
Research rept.,
Wayne A. Woods. 23 May 75, 72p Rept no. USNA-TSPR-74
Report on a Trident Scholar Project.

Descriptors: *Electroencephalography, *Neurology, *Personality tests, Brain, Waves, Voltage, Psychological tests, Motivation, Performance tests, Naval personnel, Performance(Human), Correlation techniques, Questionnaires.
Identifiers: Cornell word form test, Personality factor questionnaire, Motivation analysis test, Athletic motivation inventory, Midshipmen.

This study was conducted to determine if neurological differences between individuals - as measured by brain wave characteristics - are related to their psychological/motivational profiles. The hypothesis was that voltage levels produced by brain wave activity would be significantly different between high and low scorers on specified pyschological/motivational variables. A psychological/motivational profile was obtained for each of 76 sophomore students at the Naval Academy from the results of 4 tests: (1) Cornell Word Form Test (CWF-2); (2) 16 Personality Factor Questionnaire (16PF); (3) Motivation Analysis Test (MAT); and (4) Athletic Motivation Inventory (AMI). Neurological data was obtained by an EEG measurement of each subject. A simple analysis of variance test was performed to determine significant differences (p .05) between mean voltage levels of high and low groups. Findings indicate that individuals with probably a 'better' personality adjustment had significantly lower voltage levels at frequencies above 20 hertz. Results have demonstrated the ability to quantify aspects of personality which heretofore were considered to exist only within the 'mind'. The physical dimension of personality can be considered as an integral part of the more elusive mental dimension. A major significance of the results lies in their application to counseling, therapy, and the medical field in general. The use of neurological data for identifying personality problems might possibly expedite diagnosis and provide a more accurate patient progress monitor. (Author)

AD-A015 995/4GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Marrow Erythroid and Neutrophil Cellularity in the Dog.
Final rept.,
Kurt A. Deubelbeiss, John T. Dancey, Laurence A. Harker, Barbara Cheney, and Clement A. Finch. 21 May 74, 11p Rept no. LAIR-76-006
Availability: Pub. in Jnl. of Clinical Investigation, v55 p825-832 Apr 75.

Descriptors: *Bone marrow, *Dogs, *Hematology, *Cells(Biology), Biopsy, Kinetics, Reprints.
Identifiers: Leukokinetics, Erythroid cells, Ferrokinetics, Marrow cellularity.

This paper describes a method for determining the number of marrow erythroid and neutrophil cells in which the cellularity of marrow sections was related to that of the total marrow by radioiron dilution. Tissue sections were prepared from methacrylate-embedded dog marrow biopsies, and neutrophils were identified by staining of their primary granules. After correction of direct section counts for multiple counting error, accurate neutrophil-erythroid ratios were established with a coefficient of variation of less than 10% when 10,000 cells were examined. An average neutrophil-erythroid ratio of 1.2 was found in six normal dogs.

AD-A015 998/8GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Redesigned Apparatus for Anaerobic Measurement of Blood pH at Low Temperatures.
Final rept.,
Thomas A. Bensinger, Judy Metro, and Ernest Beutler. 5 Jul 74, 7p Rept no. LAIR-76-010
Availability: Pub. in American Jnl. of Clinical Pathology, v63 n2 p264-268 Feb 75.

Descriptors: *Blood analysis, pH factor, Measurement, Anaerobic processes, Blood preservation, Low temperature, Reprints.

A newly designed apparatus for anaerobic measurement of blood pH at low temperatures is presented. This apparatus features a larger glass electrode surface area, which is necessary to overcome the increased resistance of the glass as blood pH determinations at 0-15 C are undertaken. Utilization of this equipment has confirmed the delta pH per degree C of whole blood to be 0.0156, while intracellular pH of blood has a delta pH per degree C of 0.0165. (Author)

AD-A016 000/2GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Sleep Deprivation in Humans,
Paul Naitoh, and William Dement. 1975, 8p Rept no. 73-38
Availability: Pub. in Handbook of Electroencephalogram and Clinical Neurophysiology, v7A p7A46-7A51 1975.

Descriptors: *Epilepsy, *Sleep deprivation, Diagnosis(Medicine), Electroencephalography, Activation, Rapid eye movement in sleep, Stress(Physiology), Sleep, Stimulation(Physiology), Light, Reprints.

Sleep deprivation was discussed as a method of provoking abnormal electroencephalographic (EEG) discharges in patients with diagnosis of suspected epilepsy. A summary of current status of sleep deprivation as an activation method was given. Sleep loss would be a safe and effective clinical tool for diagnosis of epilepsy. (Author)

AD-A016 009/3GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Correction of T Cell Function by Thymosin in New Zealand Mice.
Medical research progress rept.,
M. Eric Gershwin, Aftab Ahmed, Alfred D. Steinberg, Gary B. Thurman, and Allan L. Goldstein. 1974, 6p
Availability: Pub. in Jnl. of Immunology, v113 n3 p1068-1071 Sep 74.

Descriptors: *Immunology, *Autoimmune diseases, Mice, New Zealand, Reprints.
Identifiers: *Thymosin, T cells.

New Zealand NZB x NZW F sub 1 (NZB/W) female mice, after 7 month of age, manifest a large number of immunologic abnormalities including decreased ability to reject skin allografts, decline in capacity of lymphoid cells to respond to allogeneic cells or other mitogens, and diminished primary response to sheep red blood cells (SRBC). These abnormalities have been attributed to loss of subpopulations of T cells due to development of natural thymocytotoxic antibody (NTA) or absence of serum thymic hormone. The latter hypothesis is intriguing because of its broad clinical application to autoimmune diseases. This possibility was by administration of thymosin fraction V to 7-month NZB/W female mice in attempting to restore the immunologic capacity of these animals.

AD-A016 010/1GA PC$3.25/MF$2.25
Naval Biomedical Research Lab Oakland Calif
Spherulin and Coccidioidin: Cross-Reactions in Dermal Sensitivity to Histoplasmin and Paracoccidioidin,
H. B. Levine, Angela Restrepo-M, D. R. Ten Eyck, and D. A. Stevens. 20 Dec 74, 5p
Availability: Pub. in American Jnl. of Epidemiology, v101 n6 p512-516 1975.

Descriptors: *Coccidioidin, *Skin tests, *Epidemiology, *Dermatology, Sensitivity, Histoplasma, Reprints, Colombia, Soldiers, Antigens.

Identifiers: Histoplasmin, Paracoccidioidin, Spherulin.

Until recently coccidioidin has been the only antigenic preparation available for detecting delayed dermal sensitivity induced by an experience with Coccidioides immitis. It is prepared from autolysates of the mycelial phase (saprophytic) of the fungus. A more sensitive reagent, spherulin, was developed in 1969 from the spherule phase (parasitic) of the organism. Use of spherulin showed that coccidioidin failed to detect approximately 30% of individuals specifically sensitive to C. immitis. However the potential of spherulin to detect cross-sensitivity induced by Histoplasma capsulatum was unknown. This information was considered to be germane because of the capacity of coccidioidin to detect a histoplasmal experience. Accordingly, both reagents as well as paracoccidioidin were compared simultaneously in 365 Colombian soldiers from areas endemic for histoplasmosis but not for coccidioidomycosis. At standard strength both preparations detected nonspecific responses in 0.8% to 3% of the histoplasmin negative and positive subgroups, respectively. At 10-times standard strength both preparations cross-detected histoplasmin sensitivity comparably; 5.1% to 7.1% of histoplasmin-positive subjects reacted with the coccidioidal antigens. No pattern of cross-reactivity was observed between paracoccidioidin sensitivity and sensitivity to the coccidioidal antigens.

AD-A016 013/5GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Hepatic Levels of Cyclic AMP in Normal and Lead-Sensitized Rats after Treatment with Bacterial Endotoxin.
Medical journal rept.,
Susan L. Gartner. 20 Dec 74, 4p
Availability: Pub. in Experientia, v31 p566-567 1975.

Descriptors: *Endotoxins, *Adenosine phosphates, *Cyclic compounds, Lead(Metal), Bacteria, Rats, Liver, Reprints.

No significant change in hepatic cyclic amp was observed in normal and lead-sensitized rats after intravenous injection of bacterial endotoxin. (Author)

AD-A016 014/3GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Skin Color in Hyperbaric Oxygen.
Medical research progress rept.,
E. Hardenbergh, J. A. Miles, Jr., and D. E. Thorne. Jul 74, 5p
Availability: Pub. in Undersea Biomedical Research, v2 n1 p68-69 and p73 1975.

Descriptors: *Hyperbaric medicine, Oxygen, Diffusion, Skin(Anatomy), Ear, Colors, Modification, Penetration, Rabbits, Death, Reprints.

Skin color can change in hyperbaric oxygen atmospheres even though there is no blood circulation. A rabbit ear pinna was partially resected then resutured, resulting in congestion and discoloration of the pinna. When the animal was exposed in a hyperbaric chamber to 3 atmospheres absolute of oxygen, the color of the ear changed from slate blue to pink. This was true even in animals which had been dead several hours, suggesting transdermal diffusion of oxygen. (Author)

AD-A016 045/7GA PC$4.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Advances and Newer Concepts in Shock-1972.
1972, 51p Rept no. NAVMED-M4318.01.0008-24
Pub. in Surg. Ann., p1-49 1972.

Descriptors: *Shock(Pathology), Surgery, Physiology, Therapy, Experimental data, Blood, Antibiotics, Corticosteroid agents, Reviews, Clinical medicine, Body fluids, Metabolism, Etiology.
Identifiers: Animal models.

In the review, new information concerning the nature of the pathophysiologic alterations in shock is discussed, and new developments in treatment are described. Experimental work from study of animal models is discussed as much as possible in terms of its potential relevance to the human condition. The weight of emphasis in this chapter is on specific issues dictated by the relative amount and significance of published interest in a topic rather than by an arbitrary plan to cover the entire field.

AD-A016 097/8GA PC$4.75/MF$2.25
Missouri Univ Columbia Information Science Group
Mathematical Model for Disease Prediction.
Final rept.,
Donald A. B. Lindberg, Samuel J. Dwyer, III, and Jian K. Chang. Oct 74, 83p Rept no. MOU-IS-PR5
Contract DADA17-73-C-3004
See also report dated Feb 74, AD-776 968.

Descriptors: *Rickettsia rickettsii, Mathematical models, United States, Epidemiology, Infectious diseases, Schistosomiasis, Parasitic diseases, Puerto Rico, Predictions, Computer programming.
Identifiers: *Rocky Mountain spotted fever, *Disease predictions, Western states.

The work described in the present report centered about creation of geophysical and medical observations concerning Rocky Mountain Spotted Fever in the western United States. Two mathematical model systems were produced and tested. Both the Qualitative and the Quantitative models were demonstrated to be fully capable of predicting the occurrence of the disease, as tested against actual disease observations. In both cases a county 'grid system' was used. In addition, certain exploratory studies were initiated, pointing towards possible new directions for follow-on studies. These dealt specifically with observation of schistosomiasis and the geophysical environment of Puerto Rico, and also in more general terms dealt with evaluation of the needs for special and/or new computer support for Army personnel who carry forward similar studies in the future. These exploratory studies are presented in the final section.

AD-A016 134/9GA PC$3.75/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
Research on Trauma Indices.
Technical rept. Apr 74-Mar 75,
William J. Sacco, William P. Ashman, Conrad L. Swann, R. A. Cowley, and Arthur V. Milholland. Aug 75, 31p Rept no. EB-TR-75066
See also AD-A016 135.

Descriptors: *Trauma, Indexes(Ratios), Logistics, Models, Predictions, Mortality rates, Survival(Personnel), Respiration, Blood chemistry, Hematology, Septicemia, Therapy, Liver, Profiles, Wounds and injuries.
Identifiers: Traumatic disorders.

The paper contains retrospective and prospective studies of trauma indices based on data from severely injured patients treated at the Maryland Institute for Emergency Medicine. In the retrospective study, the values of general trauma and organ-oriented indices were related to mortality using a logistic model which permits the inclusion of variables such as age, sex, and type of hospital admission. Also sepsis variables were statistically analyzed. The results of a prospective study of 237 patients included: a comparison of predicted average death rates and actual death rates where the predictions were based on the curves derived in the retrospective study; construction of probability of death curves for combined retrospective and prospective data sets; analysis of sepsis variables and variables of hepatic dysfunction; and several characterizations of therapy. New rationales for Patient Triage and Evaluation of Care were introduced. These indices are merely numbers which may be related to a probability of survival using current therapeutic techniques. Their purpose 'at the bedside' is to augment, not to replace, the traditional precepts of history and clinical examinations.

AD-A016 135/6GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
Two Prognostic Indices for the Trauma Patient.
Technical rept. Apr 74-Mar 75,
W. J. Sacco, M. A. Goldfarb, M. A. Weinstein, Terrence F. Ciurej, and R. A. Cowley. Aug 75, 12p Rept no. EB-TR-75065
See also AD-A016 134.

Descriptors: *Trauma, Respiration, Indexes(Ratios), Blood chemistry, Hematology, Blood pressure, Predictions, Survival(Personnel), Mortality rates, Patients, Illness, Wounds and injuries, Profiles.
Identifiers: Traumatic disorders.

A trauma index, called the CHOP index, based on serum creatinine, hematocrit, serum osmolality, and systolic blood pressure was evolved from retrospective and prospective studies of 700 patients from the Maryland Institute for Emergency Medicine. A decision rule which predicts death or survival resulted in a misclassification rate of less than 10% for patients in the trauma unit for more than one day. The CHOP index and a respiratory index were utilized in a retrospective study of 177 consecutive intubated patients. Prognosis regions were specified in the space determined by the two indices. A nomogram which allows one to follow the course of a patient with respiratory problems is described. These results have been applied to military and civilian medicine including trauma patient prognosis and monitoring, triage of mass casualties, objective method of evaluating care of critically ill patients, and comparison of therapeutic regimens.

AD-A016 169/5GA PC$3.75/MF$2.25
Yale Univ New Haven Conn School of Medicine
Mechanism of Innate Resistant to Viral Encephalitis.
Annual rept. 1 Mar 74-1 Jul 75,
Robert O. Jacoby, and Pravin N. Bhatt. 1 Jul 75, 39p
Contract DAMD17-74-C-4060

Descriptors: *Immunology, *Genetics, *Encephalitis, *Virus diseases, Resistance(Biology), Immunity, Lymphatic system, Reticuloendothelial system, Mice, Experimental data, Laboratory animals.
Identifiers: Flavivirus, Banzi virus.

Prevailing explanations for genetic resistance to lethal flaviviral encephalitis in mice hold that resistance gains phenotypic expression through nonimmunological virus-host interactions. Thus tissues from resistant mice are believed to be inherently less capable, or less willing, to support viral replication than tissues from resistant mice. In contrast, data indicate that expression of genetic resistance to a flavivirus does involve immunological mechanisms. Moreover, the authors have hypothesized that immunoreactivity may be central to the phenotypic expression of resistance, rather than playing a secondary role in host defenses. Genetic resistance to a human

flavivirus (Banzi) has been studied in congenic mice. These mice are histocompatible, but differ markedly in their ability to survive parenteral challenge with Banzi virus. The results are summarized.

AD-A016 191/9GA PC$3.75/MF$2.25
Armed Forces Radiobiology Research Inst Bethesda Md
Evaluation of Biologic Activity of Attenuated Endotoxin in Mice.
Scientific rept.,
C. B. Galley, R. I. Walker, G. D. Ledney, and M. R. Gambrill. Jun 75, 24p Rept no. AFRRI-SR75-16

Descriptors: *Endotoxins, *Resistance(Biology), *Immunology, Bacteria, Attenuation, Immunity, Radioprotective agents, Bacterial diseases, Bioassay, Mice, Experimental data, Laboratory animals.
Identifiers: Lipopolysaccharides, Mitogens.

Bacterial endotoxins increase nonspecific host resistance to a number of stresses. For example, resistance to radiation-induced damage is achieved through stimulation of granulocytic proliferation by endotoxin. Endotoxin is also a B-lymphocyte mitogen and thus has been used as an adjuvant for promoting resistance to antigens such as cancer cell implants. Repeated small doses of endotoxin, furthermore, can be used to establish a refractory state (tolerance) to further challenge with endotoxin. All of the resistance enhancing actions of endotoxin described above may contribute to the ability of endotoxin to increase resistance to bacterial infections. Experiments were designed to test the hypothesis that Salmonella typhosa endotoxin could be attenuated by treatment with ferric chloride (FeCl3) and that this preparation retained the biological activity of normal endotoxin. The authors found attenuated endotoxin to be as biologically active as untreated endotoxin, but it had the additional advantage of being relatively nontoxic.

AD-A016 200/8GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Bone Graft Rehabilitation of Maxillofacial Battle Casualties.
Medical research progress rept.,
J. F. Kelly. 1971, 5p
Presented at the Annual Meeting of the Association of Military Surgeons of the United States, 17 Nov 69, Washington, D. C.
Availability: Pub. in Military Medicene , v136 n6 p562-565 Jun 71.

Descriptors: *Surgical transplantation, *Casualties, *Bones, *Dental surgery, Rehabilitation, Reprints.
Identifiers: *Bone grafts.

A bone graft technique has been developed at the Dental Research Department, Naval Medical Research Institute, Bethesda, Maryland. This technique has been successfully applied to clinical cases of maxillofacial battle casualties. An ongoing, long term study of cancellous marrow particulate graft cases is being conducted at the present time, to determine the specific clinical criteria for the aplication of this graft technique. A typical case is briefly described. (Author)

AD-A016 205/7GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Induced Metabolic Sequelae of Tularemia in the Rat: Correlation with Tissue Damage,
Michael C. Powanda, Gary L. Cockerell, James B. Moe, Fred B. Abeles, and Robert S. Pekarek. 24 Jan 75, 5p
Availability: Pub. in American Jnl. of Physiology, v229 n2 p479-483 Aug 75.

Descriptors: *Tularemia, *Metabolism, *Liver, Abscesses, Blood serum, Zinc, Concentration(Chemistry), Amino acids, Mucus, Lesions, Serum globulin, Biosynthesis, Rats, Immunity, Virulence, Pasteurella tularensis, Live vaccines, Damage, Liver diseases, Reprints.
Identifiers: Pyogranulomatous lesions, Macrofetoprotein.

Serum and liver zinc concentration, amino acid uptake by liver, seromucoid content, and alpha-sub-2-macrofetoprotein production were measured in vaccinated as well as nonimmune rats exposed to either virulent (SCHU S4) or attenuated (LVS) strains of Francisella tularensis. It appears that liver damage (pyogranulomatous lesions) must occur before there is any alteration in the above variables. The presence of bacteria in the liver is not of itself sufficient to lead to the onset of systemic, induced metabolic sequelae (IMS). The occurrence of zinc redistribution in all instances of increased serum protein synthesis may imply a necessary relationship between these two sequelae. Amino acid redistribution does not appear to be linked to serum protein synthesis. An endogenous mediator of systemic IMS can be detected in tularemic rats by injection of the serum of these animals into healthy recipients. The occurrence of zinc redistribution and increased serum protein synthesis in some groups of rats in the absence of amino acid uptake by liver, as well as the apparent differential dose responsiveness of these responses, are suggestive of a multiplicity of endogenous mediators. (Author)

AD-A016 206/5GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Peroxisome Depletion in Rat Liver during Pneumococcal Sepsis,
Peter G. Canonico, John D. White, and Michael C. Powanda. 15 Apr 75, 5p
Availability: Pub. in Laboratory Investigation, v33 n2 p147-150 1975.

Descriptors: *Infectious diseases, *Liver, *Cells(Biology), Diplococcus, Cell structure, Reduction, Serum proteins, Biosynthesis, Bacterial diseases, Liver diseases, Catalase, Uric acid, Dehydrogenases, Reprints.
Identifiers: *Peroxisomes, Microbodies(Intracellular), Pneumococcus, Urate oxidase.

Biochemical and morphometric analysis reveal that the peroxisomal content of rat liver cells is markedly reduced during pneumococcal sepsis. It is suggested that during some bacterial infections, hepatic synthesis of acute-phase serum proteins occurs at the expense of peroxisomal protein synthesis and results in reduction of the peroxisomal protein pool and number of peroxisomes. (Author)

AD-A016 231/3GA PC$5.25/MF$2.25
Stanford Univ Calif Dept of Statistics
Sequential Medical Trials for Comparing an Experimental with a Standard Treatment.
Technical rept.,
Albert John Petkau. 30 Jul 75, 124p Rept no. TR-221
Contract N00014-67-A-0112-0085

Descriptors: *Therapy, *Clinical medicine, Decision making, Mathematical models, Comparison, Probability, Sequential analysis, Decision theory, Bayes theorem.
Identifiers: *Medical decision making, Wiener processes.

The research is concerned with a cost function approach to the design of sequential medical trials for comparing an experimental with a standard treatment. It is assumed that all available patients must be treated with one of the two treatments. The standard and experimental treatments are characterized by known and unknown probabilities of success respectively. Two costs are considered; the cost incurred every time either of the treatments fails and a special cost per patient treated in the experimental portion of the plan.

AD-A016 236/2GA PC$5.25/MF$2.25
Massachusetts Inst of Tech Cambridge Dept of Mathematics
Sequential Medical Trials for Comparing an Experimental with a Standard Treatment.
Technical rept.,
Albert John Petkau. 30 Jul 75, 124p Rept no. TR-1
Contract N00014-75-C-0555
Also pub. as Stanford Univ., Calif. Dept. of Statistics, Technical Report-221 under Contract N00014-67-A-0112-0085.

Descriptors: *Therapy, *Clinical medicine, Decision making, Mathematical models, Comparison, Probability, Sequential analysis, Decision theory, Bayes theorem.
Identifiers: *Medical decision making, Wiener processes.

The research is concerned with a cost function approach to the design of sequential medical trials for comparing an experimental with a standard treatment. It is assumed that all available patients must be treated with one of the two treatments. The standard and experimental treatments are characterized by known and unknown probabilities of success respectively. Two costs are considered; the cost incurred every time either of the treatments fails and a special cost per patient treated in the experimental portion of the plan.

CEA-CONF-2959 PC$4.00/MF$2.25
CEA, 91 - Orsay (France). Service Hospitalier Frederic Joliot.
Tumor Localization Using Compounds Labelled with Cyclotron Produced Short Lived Radionuclides.
D. Comar. 1974, 11p CONF-741247-1
U.S. Sales Only.

Descriptors: (*Neoplasms, *Diagnostic techniques), (*Patients, *Scintiscanning), (*Oxygen 15, Diagnostic techniques), (*Carbon 11, Diagnostic techniques), Fluorine 18, Labelled compounds, Nitrogen 13, Nuclear medicine, Radionuclide administration.

For abstract, see NSA 32 08, number 20025.

CONF-750465-1 PC$4.25/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Radiology.
Radionuclide Computerized Tomography for Brain Study.
D. E. Kuhl, R. Q. Edwards, A. Alavi, M. Reivich, and H. Rothenberg. 16 Apr 75, 23p

Descriptors: (*Brain, Blood flow), (*Blood flow, *Measuring methods), (*Inflammation, *Diagnosis), Cell membranes, Cerebrospinal fluid, Fluid flow, Isomeric nuclei, Nuclear medicine, Patients, Permeability, Radionuclide administration, Radionuclide kinetics, Scintiscanning, Technetium 99.

For abstract, see NSA 32 08, number 20026.

NTIS/PS-75/777/3GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Venereal Diseases (A Bibliography with Abstracts).
Rept. for 1964-Jul 75,
Elizabeth A. Harrison. Oct 75, 59p*
Supersedes NTIS/PS-75/095.

Descriptors: *Bibliographies, *Venereal diseases, Infectious diseases, Syphilis, Gonorrhea, Immunology, Urogenital diseases, Diagnosis, Immunology, Pathology, Epidemiology.

The bibliography cites reports on diagnosis, medical research, pathology, clinical medicine, immunology, and epidemiology of venereal diseases. Specific diseases covered are gonorrhea, granuloma inguinale, lymphogranuloma venereum, neurosyphilis, syphilis, and tabes dorsalis. (Contains 54 abstracts)

NTIS/PS-75/780/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Medicare and Medicaid Programs - Utilization and Evaluation (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Pernell W. Crockett. Oct 75, 93p*
Supersedes NTIS/PS-75/012.

Descriptors: *Bibliographies, *Medical services, *Social services, Evaluation, Utilization, Projects, Social welfare, Information services, Accounting.
Identifiers: Medicare, Medicaid, Medicare management information systems, Management information systems.

The bibliography cites reports on the utilization and evaluation of Medicare and Medicaid programs. Management information systems and accounting procedures are included. (Contains 88 abstracts)

NTIS/PS-75/781/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Vaccines and Immunity (A Bibliography with Abstracts).
Rept. for 1970-Oct 75,
Pernell W. Crockett. Oct 75, 192p*
Supersedes NTIS/PS-74/128.

Descriptors: *Bibliographies, *Immunity, *Vaccines, Evaluation, Bioassay, Humans, Laboratory animals, Serology, Infectious diseases, Bacterial diseases, Viral diseases, Respiratory diseases.

The citations include research on the clinical and laboratory evaluations of vaccines, and studies on immune responses to infections. (Contains 187 abstracts)

N75-30771/0GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
Aerospace Medicine and Biology: A Continuing Bibliography with Indexes, Supplement 143.
Jul 75, 80p NASA-SP-7011(143)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Exobiology, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 1321

PB-245 174/8GA PC$5.25/MF$2.25
Oregon Univ., Eugene.
Allied Health Manpower Study.
Final rept. 28 Jun 73-30 Nov 74,
Morlan B. Lewis. Nov 74, 114p HRA/OC-76/043
Contract N01-AH-34128

Descriptors: *Medical personnel, Manpower, Education, Universities, Planning, Recommendations, Statistical data, Regional planning, Demand(Economics), Oregon, Management, Tables(Data).
Identifiers: *Allied health personnel.

The report provides guidance to the administration and faculty of the University of Oregon in planning for future planning expansion or reduction of existing programs in health manpower education. Statistics presented relate to the entire state; however, the conclusions and recommendations focus exclusively on the future role of the University of Oregon.

PB-245 373/6GA PC$10.25/MF$2.25
Minnesota Systems Research, Inc., Minneapolis.
The Provision of Health Care Services to Adolescents in the 1970's,
Betty J. Hallstrom, Joachim M. Banda, Nancy Ouradnik, Jan Parkinson, and Vernon E. Weckwerth. 7 Nov 72, 376p MCHS-71-1

Descriptors: *Medical services, Mental hygiene, Interviews, Recommendations, Utilization, Requirements, Reviews, Questionnaires, National government, Sociology, Social psychology.
Identifiers: Teenagers, *Adolescents, Youths, Health care delivery systems.

The study develops a framework for decision making regarding the use of funds for adolescent health care needs. The special needs of adolescents and the available resources to serve these needs are identified. Various types of programs designed to deal with adolescent health problems are analyzed. The final part of the study identifies and discusses the merits of major issues the federal government faces in the delivery of specialized care to adolescents and concludes with recommendations based on its findings.

PB-245 550/9GA PC$7.50/MF$2.25
California Univ., Los Angeles. Div. of Operations Research.
Methodologies for the Evaluation and Improvement of Emergency Medical Service Systems. Volume II. Appendices.
Final rept. 1 May 68-29 Feb 72,
Louis E. Davis, Robert B. Andrews, Eugene P. Durbin, Alan N. Nahum, and Eric L. Trist. Aug 75, 240p DOT-HS-801 704
Contract FH-11-6849
See also PB-244 462, and PB-245 551.

Descriptors: *Medical services, Evaluation, Methodology, Surveys, Planning, Questionnaires, Tests, Training programs.
Identifiers: *Emergency medical services, Health care delivery systems, DOT/3D, DOT/4DZ/DF, Paramedical personnel.

The volume contains the appendices to the Final Report of the UCLA Emergency Medical Service Systems Project. Several kinds of detailed information are provided. These include: (1) the numerous data and questionnaire forms, which were developed for studies and surveys, (2) the enabling state legislation, training program, medication and supplies, and sample transcripts of operational runs for the demonstration study of Mobile Intensive Care Units manned by paramedics, (3) the protocol for the demonstration of air ambulance helicopters, and (4) the contents of helicopter transportable field kits for Mobile Disaster Teams.

PB-245 551/7GA PC$5.25/MF$2.25
California Univ., Los Angeles. Div. of Operations Research.
Methodologies for the Evaluation and Improvement of Emergency Medical Service Systems. Volume III. Computerized Ambulance Location Logic Users Manual: PL/I and FORTRAN Versions.
Final rept. 1 Jul 68-31 Aug 71,
James A. Fitzsimmons. Aug 75, 120p DOT--HS-801 705
Contract FH-11-6849
See also Volume 2, PB-245 550.

Descriptors: *Medical services, Models, Planning, Evaluating, Ambulances, Simulation, Data processing, FORTRAN, Programming languages, Responses, Computer programs, PL/1 programming language.
Identifiers: *Emergency medical services, Health care delivery systems, DOT/3D, DOT/4DZ/DF.

An efficient and general method of seeking an optimal deployment of emergency medical vehicles, in terms of minimizing the response time, is presented. The method combines a queuing model, an optimum seeking nonlinear algorithm, and simulation. This queuing model describes a system in which the arrival rate is distributed in a Poisson manner, the service time may have any distribution and no waiting occurs because the available providers of services are infinite in number. The search routine is that developed by Hooke and Jeeves. The queuing model is used to estimate a conditional mean response time for the given locations of hospitals and any initial set of locations of the emergency medical vehicles. The probabilities of one, two, etc., emergency medical vehicles being busy, and hence increasing the mean response time, are estimated by simulation. The search routine directs changes in the locations of the emergency medical vehicles with the object of progressively decreasing the mean response time. Portions of this document are not fully legible.

TID-3319-S6 PC$10.60/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Bibliography on Nuclear Medicine. Volumes 28--30.
Jul 75, 379p

Descriptors: (*Nuclear medicine, *Bibliographies), Diagnostic techniques, Patients, Radionuclide administration.

For abstract, see NSA 32 08, number 20029.

6F. Environmental Biology

AD-A016 150/5GA PC$3.25/MF$2.25
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Laboratory Response of 'Aedes triseriatus' (Say) to Four Developmental Inhibitors.
Special study Aug 74-May 75,
Richard D. Wells, and Jimmy H. Nelson. May 75, 17p Rept no. USAEHA-44-049-74/76

Descriptors: *Culicidae, *Insecticides, Aliphatic acids, Pesticides, Insects, Entomology, Dosage, Response(Biology), Larvae, Experimental data, Tables(Data), Life cycles, Mortality rates.
Identifiers: Aedes triseriatus, Mosquitoes, *Methoprene, *Dodecadienoates, Recommendations.

The dosage response of Aedes triseriatus (Say) was determined for two methoprene formulations and two experimental compounds in laboratory tests. The LC95 for Altosid SR-10, Altosid 10-F, AI3-36093, and AI3-36206 was .000971 parts per million (ppm), each developmental inhibitor killed A. triseriatus at an earlier pupal developmental stage than at the lower concentrations.

N75-30642/3GA PC$4.25/MF$2.25
Lockheed Electronics Co., Houston, Tex. Aerospace Systems Div.
A Recognition Key to Salt Marsh Mosquito (Aedes Sollicitans) Breeding Areas in South Galveston County.
G. K. Arp. Oct 74, 53p NASA-CR-144404, LEC-4691

Contract NAS9-12200

Descriptors: *Insects, *Larvae, *Remote sensors, *Texas, Aerial photography, Multispectral band scanners, Technology utilization.

For abstract, see STAR 1321

ORNL-EIS-75-77 PC$21.75/MF$2.25
Oak Ridge National Lab., Tenn.
Radionuclide Movement in Soils and Uptake by Plants. A Selected, Annotated Bibliography.
C. W. Francis, S. S. Talmage, and B. B. McMullin. Aug 75, 371p

Descriptors: (*Radionuclide migration, *Bibliographies), (*Radionuclide kinetics, Bibliographies), (*Soils, Radionuclide migration), (*Plants, Radionuclide kinetics), Cesium 137, Diffusion, Fallout, Fission products, Radioisotopes, Strontium 90, Terrestrial ecosystems, Thorium, Uptake, Uranium.

For abstract, see NSA 32 08, number 20024.

6G. Escape, Rescue, and Survival

AD-A016 271/9GA PC$4.75/MF$2.25
LTV Aerospace Corp Dallas Tex Vought Aeronautics Div
SENDS Escape Alert System Development Program. Phase II - Aircraft/Aircrew Analysis. Phase III - Aircraft Computer Program.
Final rept. 9 Dec 74-28 Mar 75,
Edwin O. Cartwright, Thomas L. Harper, George D. Sepp, Robert L. Dauber, and Albert L. Hauschild. May 75, 97p NADC-95190-40
Contract N62269-74-C-0523

Descriptors: *Escape systems, *Naval aircraft, Monitors, Display systems, Computer applications, Onboard, Time, Ejection, Emergencies, Inflight.
Identifiers: SENDS(Safe Ejection Envelope Display System), Safe ejection envelope display system, Escape capability, Margin of safety.

The SENDS system is designed to provide the aircrewman with a continuous indication of inflight escape capability. The concept, as conceived by VSD, monitors the aircraft dynamic correlation by means of onboard sensors, provides these data to an onboard computer which computes escape capability in accordance with NATOPS manual criteria, and then displays the current status in terms of time remaining to indicate an ejection and still be within the safe recovery envelope of the escape system.

6H. Food

AD-A016 109/1GA PC$3.25/MF$2.25
Army Natick Development Center Mass Food Engineering Lab
Cooked, Boneless Turkey Rolls: The Effect of Ground Skin and Frozen Storage on Quality and Acceptance.
Final technical rept.,
R. D. Culler, and S. R. Drake. Aug 75, 18p Rept no. FEL-43 NDC-TR-75-95-FEL

Descriptors: *Meat, *Turkey, *Frozen foods, Storage, Quality, Acceptability, Food preservation, Flavor, Odors, Texture.

A 1-yr storage study was conducted on cooked, boneless, turkey rolls with three levels of emulsified skin (0, 6 and 12%) incorporated into rolls with a 60:40 ratio of light to dark turkey meet. Sodium tripolyphosphate (0.5%, wt/wt) and salt 1.5% (wt/wt) were added as binding agents. Turkey rolls were stored at -17C and evaluated at 0, 1, 2, 3, 6, 9 and 12 months. Addition of 6% emulsified skin into the turkey rolls had no significant effect on sensory panel scores. With 12% emulsified skin, color and appearance were the only sensory panel scores to show a significant decrease in value; whereas, odor, flavor and texture continued to show no significant change.

AD-A016 111/7GA PC$7.00/MF$2.25
Army Natick Development Center Mass
Uniform Ration Cost System - Summary Report.
Final technical rept.,
R. P. Richardson, Philip Brandler, Robert J. Byrne, Ronald Deacon, and John E. Rogozenski, Jr. Jun 75, 188p Rept no. NDC-TR-75-69-OR/SA

Descriptors: *Food dispensing, *Costs, Feeding, Military rations, Nutrition, Menu, Planning.

The objective of this study is to develop a uniform ration cost system (URCS) that is directly related to known consumer requirements and that includes provisions which make possible a more flexible food service management system. A comprehensive analysis of the current DoD ration cost system has been conducted, resulting in the identification of areas of potential improvement. One of these areas, the setting of an appropriate level of feeding for DoD, has involved a quantitative comparison of food utilization in the military with that of comparable civilian organizations. The recommended URCS contains a Uniform Ration Law that incorporates a cost-date standard (i.e., authorized ration cost as of a selected data). The URCS also provides a more flexible approach for formulating a new food cost index that is consistent with the cost-date standard, nutritional standards, and consumer acceptance considerations. The study describes mathematical programming and computer methods for designing the food cost index.

PB-245 430-SET/GA PC$274.00
Litton Bionetics, Inc., Kensington, Md.
Mutagenic Evaluation of FDA Compounds.
1974, 6151p-in 86 issues
Consists of PB-245 431 thru PB-245 516.

No abstract available.

PB-245 430/GA
see prices of individual reports
Litton Bionetics, Inc., Kensington, Md.
Mutagenic Evaluation of FDA Compounds.
1974,86 issues

Mutagenic test results are reported in microbial and mammalian cell systems. For individual reports, see below:

FDABF-GRAS-275. FDA 71-73, Starter Distillate. 25 Nov 74, 48p, PC$3.75, MF$2.25 **PB-245 431/2GA**
FDABF-GRAS-276. FDA 71-83, Caramel. 17 Dec 74, 49p, PC$3.75, MF$2.25 **PB-245 432/0GA**
FDABF-GRAS-277. FDA 73-52, Inositol. 17 Dec 74, 48p, PC$3.75, MF$2.25 **PB-245 433/8GA**
FDABF-GRAS-278. FDA 73-4, Potassium Sorbate. 25 Nov 74, 48p, PC$3.75, MF$2.25 **PB-245 434/6GA**
FDABF-GRAS-279. FDA 71-64, Ferrous Sulfate. 29 Oct 74, 43p, PC$3.75, MF$2.25 **PB-245 435/3GA**
FDABF-GRAS-280. FDA 71-79 Sodium Bicarbonate. 9 Oct 74, 40p, PC$3.75, MF$2.25 **PB-245 436/1GA**
FDABF-GRAS-281. FDA 71-66, Erythorbic Acid. 9 Oct 74, 45p, PC$3.75, MF$2.25 **PB-245 437/9GA**
FDABF-GRAS-282. FDA 71-72, Glucono-Delta-Lactone. 9 Oct 74, 45p, PC$3.75, MF$2.25 **PB-245 438/7GA**
FDABF-GRAS-283. FDA 71-36, Calcium Propionate. 9 Oct 74, 43p, PC$3.75, MF$2.25 **PB-245 439/5GA**
FDABF-GRAS-284. FDA 71-90, Malic Acid. 25 Nov 74, 48p, PC$3.75, MF$2.25 **PB-245 440/3GA**
FDABF-GRAS-285. FDA 71-39, Propyl Gallate. 31 Dec 74, PC$5.75, MF$2.25 **PB-245 441/1GA**
FDABF-GRAS-286. FDA 71-30, Oil of Clove. 10 Jan 75, PC$5.75, MF$2.25 **PB-245 442/9GA**
FDABF-GRAS-287. FDA 71-53, Powdered Agar. 10 Dec 74, 144p, PC$5.75, MF$2.25 **PB-245 443/7GA**
FDABF-GRAS-288. FDA 71-57, Menthol. 14 Jan 75, 158p, PC$6.25, MF$2.25 **PB-245 444/5GA**
FDABF-GRAS-289. FDA 71-55, Tartaric Acid. 13 Jan 75, 156p, PC$6.25, MF$2.25 **PB-245 445/2GA**
FDABF-GRAS-291. FDA 71-28, Oil of Nutmeg. 19 Nov 74, 154p, PC$6.25, MF$2.25 **PB-245 447/8GA**
FDABF-GRAS-292. FDA 71-36, Calcium Propionate. 13 Sep 74, 101p, PC$5.25, MF$2.25 **PB-245 448/6GA**
FDABF-GRAS-293. FDA 71-32, Mannitol U.S.P. 31 Oct 74, 145p, PC$5.75, MF$2.25 **PB-245 449/4GA**
FDABF-GRAS-294. FDA 71-56, Propylene Glycol. 5 Mar 74, 94p, PC$4.75, MF$2.25 **PB-245 450/2GA**
FDABF-GRAS-295. FDA 71-49, Zinc Sulfate. 20 Sep 74, 98p, PC$4.75, MF$2.25 **PB-245 451/0GA**
FDABF-GRAS-296. FDA 71-40, Dilauryl Thiodipropionic Acid. 1 Nov 73, 104p, PC$5.25, MF$2.25 **PB-245 452/8GA**
FDABF-GRAS-297. FDA 71-37, Sodium Benzoate. 20 Sep 74, 94p, PC$4.75, MF$2.25 **PB-245 453/6GA**
FDABF-GRAS-298. FDA 71-1, Ammoniated Glycerrhizin. 24 Nov 72, 121p, PC$5.25, MF$2.25 **PB-245 454/4GA**
FDABF-GRAS-299. FDA 71-12, Gum Tragacanth. 24 Nov 72, 108p, PC$5.25, MF$2.25 **PB-245 455/1GA**
FDABF-GRAS-300. FDA 71-20, Sodium Bisulfite. 24 Nov 72, 115p, PC$5.25, MF$2.25 **PB-245 456/9GA**
FDABF-GRAS-301. FDA 71-41, Calcium Silicate. 15 Nov 74, 146p, PC$5.75, MF$2.25 **PB-245 457/7GA**
FDABF-GRAS-302. FDA 71-43, Talc. 9 Dec 74, 145p, PC$5.75, MF$2.25 **PB-245 458/5GA**
FDABF-GRAS-303. FDA 71-38, Methylparaben. 6 Dec 74, 144p, PC$5.75, MF$2.25 **PB-245 459/3GA**
FDABF-GRAS-304. FDA 71-24, Butylated Hydroxyanisole. 30 Aug 74, 124p, PC$5.25, MF$2.25 **PB-245 460/1GA**
FDABF-GRAS-305. FDA 71-33, Stannous Chloride. 31 Dec 74, 124p, PC$5.25, MF$2.25 **PB-245 461/9GA**
FDABF-GRAS-306. FDA 71-46, Sodium Tripolyphosphate. 6 Jan 75, 137p, PC$5.75, MF$2.25 **PB-245 462/7GA**
FDABF-GRAS-307. FDA 71-54, Citric Acid. 8 Jan 75, 139p, PC$5.75, MF$2.25 **PB-245 463/5GA**
FDABF-GRAS-308. FDA 71-52, Furcelleran. 31 Oct 74, 144p, PC$5.75, MF$2.25 **PB-245 464/3GA**
FDABF-GRAS-309. FDA 71-51, Methocel. 22 Nov 74, 143p, PC$5.75, MF$2.25 **PB-245 465/0GA**
FDABF-GRAS-310. FDA 71-50, Adipic Acid. 9 Dec 74, 144p, PC$5.75, MF$2.25 **PB-245 466/8GA**
FDABF-GRAS-311. FDA 71-48, Silica Aerogel. 24 Oct 74, 154p, PC$6.25, MF$2.25 **PB-245 467/6GA**
FDABF-GRAS-312. FDA 71-45, Synthetic Silica Sodium Silicoaluminate. 15 Nov 74, 141p, PC$5.75, MF$2.25 **PB-245 468/4GA**
FDABF-GRAS-313. FDA 71-44, Caffeine. 22 Jul 74, 97p, PC$4.75, MF$2.25 **PB-245 469/2GA**
FDABF-GRAS-314. FDA 71-26, Oil of Mustard. 9 Jan 75, 161p, PC$6.25, MF$2.25 **PB-245 470/0GA**

FDABF-GRAS-315. FDA 71-3, Sodium Carrageenan. 24 Nov 72, 91p, PC$4.75, MF$2.25 **PB-245 471/8GA**

FDABF-GRAS-317. FDA 73-77, Magnesium Oxide. 30 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 472/6GA**

FDABF-GRAS-318. FDA 73-56, Tannic Acid. 21 Mar 75, 35p, PC$3.75, MF$2.25 **PB-245 473/4GA**

FDABF-GRAS-319. FDA 73-48, Carnauba Wax. 15 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 474/2GA**

FDABF-GRAS-320. FDA 71-75, Sodium Caseinate. 30 Apr 75, 35p, PC$3.75, MF$2.25 **PB-245 475/9GA**

FDABF-GRAS-321. FDA 73-71, Potassium Bromate (with magnesium carbonate) Granular. 30 Apr 75, 38p, PC$3.75, MF$2.25 **PB-245 476/7GA**

FDABF-GRAS-322. FDA 71-63, Ferrous Gluconate. 30 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 477/5GA**

FDABF-GRAS-323. FDA 71-88, Lecithin. 15 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 478/3GA**

FDABF-GRAS-324. FDA 71-89, Glycerine. 30 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 479/1GA**

FDABF-GRAS-325. FDA 73-41, Calcium Oxide. 15 Apr 75, 39p, PC$3.75, MF$2.25 **PB-245 480/9GA**

FDABF-GRAS-326. FDA 71-86, Calcium Sulfate. 15 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 481/7GA**

FDABF-GRAS-327. FDA 71-74, Sodium Aluminum Sulfate. 15 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 482/5GA**

FDABF-GRAS-328. FDA 73-5, Calcium Gluconate. 15 Apr 75, 38p, PC$3.75, MF$2.25 **PB-245 483/3GA**

FDABF-GRAS-329. FDA 73-51, Shellac Wax. 15 Apr 75, 37p, PC$3.75, MF$2.25 **PB-245 484/1GA**

FDABF-GRAS-330. FDA 71-21, Potassium Metabisulfite. 30 Apr 75, 35p, PC$3.75, MF$2.25 **PB-245 485/8GA**

FDABF-GRAS-331. FDA 73-3, Sodium Hexametaphosphate. 10 Jan 75, 48p, PC$3.75, MF$2.25 **PB-245 486/6GA**

FDABF-GRAS-332. FDA 71-25, Butylated Hydroxytoluene. 30 Apr 75, 36p, PC$3.75, MF$2.25 **PB-245 487/4GA**

FDABF-GRAS-333. FDA 73-43, Sodium Sulfite. 10 Jan 75, 48p, PC$3.75, MF$2.25 **PB-245 488/2GA**

FDABF-GRAS-334. FDA 73-1, Tetrasodium Pyrophosphate. 10 Jan 75, 48p, PC$3.75, MF$2.25 **PB-245 489/0GA**

FDABF-GRAS-335. FDA 71-62, Copper Gluconate. 10 Jan 75, 46p, PC$3.75, MF$2.25 **PB-245 490/8GA**

FDABF-GRAS-336. FDA 71-65, Ascorbic Acid. 10 Jan 75, 48p, PC$3.75, MF$2.25 **PB-245 491/6GA**

FDABF-GRAS-368. FDA 73-53, Malt Extract. 15 Jun 75, 35p, PC$3.75, MF$2.25 **PB-245 492/4GA**

FDABF-GRAS-369. FDA 73-49, Beeswax, White. 30 May 75, 35p, PC$3.75, MF$2.25 **PB-245 493/2GA**

FDABF-GRAS-370. FDA 73-81, Benzoyl Peroxide Lucidol-78 (wet). 15 Jun 75, 37p, PC$3.75, MF$2.25 **PB-245 494/0GA**

FDABF-GRAS-371. FDA 73-82, Sodium Ferric Pyrophosphate. 15 Jun 75, 35p, PC$3.75, MF$2.25 **PB-245 495/7GA**

FDABF-GRAS-372. FDA 73-85, Potassium Alginate. 15 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 496/5GA**

FDABF-GRAS-373. FDA 71-18, Propylene Glycol Alginate. 30 Jun 75, 39p, PC$3.75, MF$2.25 **PB-245 497/3GA**

FDABF-GRAS-374. FDA 73-68, Propyl Paraben (USP). 30 May 75, 37p, PC$3.75, MF$2.25 **PB-245 498/1GA**

FDABF-GRAS-375. FDA 73-57, Propylene Glycol Monostearate. 30 May 75, 35p, PC$3.75, MF$2.25 **PB-245 499/9GA**

FDABF-GRAS-376. FDA 73-70, Benzoic Acid, Certified A.C.S. 30 May 75, 38p, PC$3.75, MF$2.25 **PB-245 500/4GA**

FDABF-GRAS-377. FDA 73-76, Potassium Carbonate. 30 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 501/2GA**

FDABF-GRAS-378. FDA 73-74, Potassium Iodide A.C.S. Reagent, 30 Mesh Granular. 30 May 75, 37p, PC$3.75, MF$2.25 **PB-245 502/0GA**

FDABF-GRAS-379. FDA 73-83, Mustard, Yellow. 30 May 75, 35p, PC$3.75, MF$2.25 **PB-245 503/8GA**

FDABF-GRAS-380. FDA 73-69, Sodium Carboxymethylcellulose Cellulose Gum, Low Viscosity. 30 May 75, 36p, PC$3.75, MF$2.25 **PB-245 504/6GA**

FDABF-GRAS-381. FDA 71-59, Mono- and Di-Glycerides Monosodium Phosphate Derivates. 30 May 75, 37p, PC$3.75, MF$2.25 **PB-245 505/3GA**

FDABF-GRAS-382. FDA 73-42, Ammonium Sulfate Granular, Food Grade. 30 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 506/1GA**

FDABF-GRAS-383. FDA 73-78, Potassium Chloride USP Granular. 30 Jun 75, 38p, PC$3.75, MF$2.25 **PB-245 507/9GA**

FDABF-GRAS-384. FDA 73-2, Monosodium Phosphate Anhydrous Powdered, FCC Grade. 30 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 508/7GA**

FDABF-GRAS-385. FDA 71-81, Monocalcium Phosphate. 30 Jun 75, 37p, PC$3.75, MF$2.25 **PB-245 509/5GA**

FDABF-GRAS-386. FDA 71-24, Butylated Hydroxyanisole. 30 Apr 75, 35p, PC$3.75, MF$2.25 **PB-245 510/3GA**

FDABF-GRAS-387. FDA 71-27, Oil of Garlic. 30 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 511/1GA**

FDABF-GRAS-388. FDA 73-86, Sodium Calcium Alginate. 15 Jun 75, 35p, PC$3.75, MF$2.25 **PB-245 512/9GA**

FDABF-GRAS-389. FDA 73-65, Monopotassium Phosphate Granular Food Grade. 15 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 513/7GA**

FDABF-GRAS-390. FDA 73-84, Ferric Ortho Phosphate White Food Grade, Phase I. 15 Jun 75, 37p, PC$3.75, MF$2.25 **PB-245 514/5GA**

FDABF-GRAS-391. FDA 73-23, Ammonium Alginate. 30 Jun 75, 38p, PC$3.75, MF$2.25 **PB-245 515/2GA**

FDABF-GRAS-392. FDA 73-87, Sodium Alginate. 15 Jun 75, 36p, PC$3.75, MF$2.25 **PB-245 516/0GA**

PB-245 517/GA see prices of individual reports
Food and Drug Research Labs., Inc., Waverly, N.Y.
Teratologic Evaluation of FDA Compounds.
Final rept.
1975,20 issues

Teratological test results are reported in mice and rats. For individual reports, see below:

FDABF-GRAS-337. FDA 71-65, Ascorbic acid. 10 Jan 75, 34p, PC$3.75, MF$2.25 **PB-245 518/6GA**

FDABF-GRAS-338. FDA 71-56, Tannic Acid. 31 Jan 75, 34p, PC$3.75/MF$2.25 **PB-245 519/4GA**

FDABF-GRAS-339. FDA 73-4, Potassium sorbate; Sorbistat 31 Jan 75, 34p, PC$3.75/MF$2.25 **PB-245 520/2GA**

FDABF-GRAS-340. FDA 73-65, Monopotassium phosphate. 21 Mar 75, 33p, PC$3.75/MF$2.25 **PB-245 521/0GA**

FDABF-GRAS-341. FDA 73-76, Potassium Carbonate. 3 Mar 75, 35p, PC$3.75/MF$2.25 **PB-245 522/8GA**

FDABF-GRAS-342. FDA 73-83, Mustard flour-untreated. 19 Feb 75, 34p, PC$3.75/MF$2.25 **PB-245 523/6GA**

FDABF-GRAS-343. FDA 73-82, Ferric sodium pyrophosphate. 12 Mar 75, 34p, PC$3.75/MF$2.25 **PB-245 524/4GA**

FDABF-GRAS-344. FDA 73-83-H, Mustard flour-treated. 3 Mar 75, 34p, PC$3.75/MF$2.25 **PB-245 525/1GA**

FDABF-GRAS-345. FDA 73-69, Sodium Carboxymethylcellulose. 12 Mar 75, 35p, PC$3.75/MF$2.25 **PB-245 526/9GA**

FDABF-GRAS-346. FDA 73-2, Monosodium phosphate, anhydrous. 10 Jan 75, 34p, PC$3.75/MF$2.25 **PB-245 527/7GA**

FDABF-GRAS-347. FDA 73-78, Potassium Chloride. 19 Feb 75, 34p, PC$3.75/MF$2.25 **PB-245 528/5GA**

FDABF-GRAS-348. FDA 71-21, Potassium metabisulfite. 21 Mar 75, 34p, PC$3.75/MF$2.25 **PB-245 529/3GA**

FDABF-GRAS-349. FDA 73-58, Monopotassium glutamate. 27 Nov 74, 36p, PC$3.75/MF$2.25 **PB-245 530/1GA**

FDABF-GRAS-350. FDA 71-68, Sodium erythorbate. 13 Dec 74, 35p, PC$3.75/MF$2.25 **PB-245 531/9GA**

FDABF-GRAS-351. FDA 71-64, Ferrous sulfate. 15 Nov 74, 36p, PC$3.75/MF$2.25 **PB-245 532/7GA**

FDABF-GRAS-352. FDA 73-54, Papain. 31 Oct 74, 37p, PC$3.75/MF$2.25 **PB-245 533/5GA**

FDABF-GRAS-353. FDA 73-1, Tetrasodium pyrophosphate, anhydrous. 27 Nov 74, 36p, PC$3.75/MF$2.25 **PB-245 534/3GA**

FDABF-GRAS-354. FDA 73-3, Sodium hexametaphosphate. 31 Oct 74, 37p, PC$3.75/MF$2.25 **PB-245 535/0GA**

FDABF-GRAS-355. FDA 71-29, Oil Rue. 13 Dec 74, 37p, PC$3.75/MF$2.25 **PB-245 536/8GA**

FDABF-GRAS-356. FDA 73-41, Calcium oxide. 15 Nov 74, 36p, PC$3.75/MF$2.25 **PB-245 537/6GA**

6J. Industrial (Occupational) Medicine

PB-245 195/3GA PC$3.25/MF$2.25
Civil Service Commission, Washington, D.C. Office of Labor-Management Relations.
Health and Safety: A Survey of Provisions in Labor Agreements in the Federal Service.
Oct 75, 23p USCSC/OLMR-75/06

Descriptors: *Industrial medicine, National government, Preventive medicine, Labor relations, Surveys, Accidents, Safety, Agreements. Identifiers: *Occupational safety and health.

The report provides a review and analysis of the Health and Safety provisions based on a survey of Federal labor agreements contained in the Labor Agreement Information Retrieval System (LAIRS) file as of May 1, 1975. Key elements discussed are safety committees, equipment and clothing; reporting and investigation of unsafe conditions and accidents; and health services and preventive medicine. Sample clauses are cited in the appendix.

6K. Life Support

AD-A015 733/9GA PC$3.25/MF$2.25
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Effect of Proposed B-1 Protective Smoke Hood on Visual Psychomotor Performance.
Final technical rept.,
Morton K. Ohlbaum, and Abbott T. Kissen. Aug 75, 9p Rept no. AMRL-TR-75-55

Descriptors: *Life support, Psychomotor function, Visual perception, Headgear, Protective masks, Smoke, Cockpits, Flight crews, Acceptability, Time dependence, Performance(Human), Flight clothing, Plastics,

Transparence, Human factors engineering, Eye, Irritants.

Potential in-flight emergencies on contemporary aircraft include smoke in the cockpit even without patent fire. In order to avoid eye irritation, the use of a plastic hood to isolate the face of the aviator from the smoke has been proposed. Investigation of visual psychomotor performance indicates that the hood may be marginally satisfactory for very brief time periods, but completely unsatisfactory and potentially hazardous when work for five minutes or more. (Author)

AD-A015 740/4GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
C-141 Therapeutic Oxygen Manifold Distribution System.
Final rept. Sep 72-Jul 74,
Paul C. Baker. Aug 75, 7p Rept no. SAM-TR-75-31

Descriptors: *Breathing apparatus, Aeromedical evacuation, Oxygen, Pressure distribution, Patients, Stretchers, Tubes, Flowmeters, Valves, Site selection, Military requirements, Optimization, Jet transport planes.
Identifiers: C-141 aircraft.

The C-141 Therapeutic Oxygen Manifold System was developed to overcome deficiencies of the integral C-141 therapeutic oxygen system. Three functional units, fabricated in-house to meet design specifications and performance requirements, successfully passed all phases of DT+E; no changes were made to the hardware. Two units were made available to Military Airlift Command for Operational Test and Evaluation (OT/E). OT/E results indicated that the units were acceptable for routine use aboard C-141 aeromedical airlift missions and were a definite improvement over the integral therapeutic oxygen system. (Author)

NTIS/PS-75/774/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Underwater Breathing Apparatus (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Guy E. Habercom, Jr. Oct 75, 152p*
Supersedes NTIS/PS-75/039. See also NTIS/PS-75/775.

Descriptors: *Bibliographies, *Breathing apparatus, Underwater swimmers, Breathing masks, Oxygen masks, Divers, Oxygen supply equipment, Protective masks, Pressure breathing.
Identifiers: *Underwater breathing apparatus, *Scuba equipment, *Scuba divers, *Diver equipment.

Underwater breathing apparatus and related accessories are investigated in these Government-sponsored research reports. (Contains 147 abstracts)

NTIS/PS-75/775/7GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Underwater Clothing, Tools, and Equipment (A Bibliography with Abstracts).
Rept. for Jul 64-Oct 75,
Guy E. Habercom, Jr. Oct 75, 169p*
Supersedes NTIS/PS-75/038.

Descriptors: *Bibliographies, *Underwater clothing, *Underwater equipment, *Tools, Divers, Diving suits, Underwater swimmers, Hand tools, Underwater lights, Underwater construction, Human factors engineering.
Identifiers: *Underwater tools, *Diver equipment.

Design and performance of diver's clothing, tools, and equipment are reviewed in these Government-sponsored research reports. (Contains 164 abstracts) See NTIS/PS-75/774, Underwater Breathing Equipment.

N75-30769/4GA PC$3.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
Space Garden.
N. Mishina. Aug 75, 5p NASA-TT-F-16421
NASA ORDER W-13183
Tran-Transl. Into English from Pravada (Moscow), 2 Apr. 1975 p 6.

Descriptors: *Closed ecological systems, *Manned space flight, *Plants (Botany), *Space flight feeding, *Vegetables, Exobiology, Life support systems, Microorganisms, Vegetation growth.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30797/5GA PC$3.25/MF$2.25
Transemantics, Inc., Washington, D.C.
Life Support Systems Aboard the Soyuz-18-Salyut-4 Flight.
A. Ivakhnov. Aug 75, 7p NASA-TT-F-16500
Contract NASW-2792
Tran-Transl. Into English from Izv. (Ussr), 7 Jun. 1975 p 5.

Descriptors: *Life support systems, *Salyut space station, *Soyuz spacecraft, Cabin atmospheres, Cosmonauts, Space flight feeding, Water reclamation.
Identifiers: Translations.

For abstract, see STAR 1321

6L. Medical and Hospital Equipment

NTIS/PS-75/778/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Blood Preservation and Storage. Volume 1. 1964-1973 (A Bibliography with Abstracts).
Rept. for 1964-1973,
Pernell W. Crockett. Oct 75, 174p*
See also Volume 2, NTIS/PS-75/779.

Descriptors: *Bibliographies, *Blood preservation, Storage, Preservatives, Packing materials, Cargo transportation, Blood transfusion, Blood cells, Viability, Stability, Oxygen transport mechanisms, In vivo analysis, Patients.
Identifiers: Blood preservatives, Cryobiology.

Presented are references on blood preservation and storage methods; preservatives; packing materials and shipping; and clinical evaluation of transfused stored blood. (Contains 169 abstracts) See also NTIS/PS-75/779, Blood Preservation and Storage. Vol 2. 1974-1975.

NTIS/PS-75/779/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Blood Preservation and Storage. Volume 2. 1974-1975 (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Pernell W. Crockett. Oct 75, 57p*
See also Volume 1, NTIS/PS-75/778. Supersedes NTIS/PS-75/010.

Descriptors: *Bibliographies, *Blood preservation, Storage, Preservatives, Packing materials, Cargo transportation, Blood transfusion, Blood cells, Viability, Stability, Oxygen transport mechanisms, In vivo analysis, Patients.
Identifiers: Blood preservatives, Cryobiology.

Presented are references on blood preservation and storage methods, preservatives; packing materials and shipping; and clinical evaluation of transfused stored blood. (Contains 52 abstracts) See also NTIS/PS-75/778, Blood Preservation and Storage. Vol. 1. 1964-1973.

N75-30772/8GA PC$4.75/MF$2.25
General Electric Co., Houston, Tex.
Skylab Imss Checklist Application Study for Emergency Medical Care.
Final Report.
J. G. Carl, and S. Furukawa. 15 Aug 75, 95p
NASA-CR-144394
Contract NAS9-14442

Descriptors: *Emergency life sustaining systems, *Skylab program, *Technology utilization, Aerospace medicine, Medical equipment, Medical science, Portable equipment.

For abstract, see STAR 1321

N75-30778/5GA PC$4.75/MF$2.25
Baylor Univ., Houston, Tex. Dept. of Ophthalmology.
The Mark 3 Haploscope.
T. A. Decker, R. E. Williams, C. L. Kuether, N. D. Logar, and D. Wyman-cornsweet. Sep 75, 81p
NASA-CR-2584
Contracts NGR-44-012-099, NGR-44-003-057

Descriptors: *Optical equipment, *Space flight, *Visual acuity, *Visual photometry, Computer techniques, Ophthalmology, Psychophysiology.

For abstract, see STAR 1321

N75-30795/9GA PC$5.25/MF$2.25
General Electric Co., Philadelphia, Pa. Space Div.
Urine Sampling and Collection System Optimization and Testing.
Final Report.
G. L. Fogal, J. A. Geating, and M. G. Koesterer. Jun 75, 111p NASA-CR-144401, GE-75SDS4231
Contract NAS9-13049

Descriptors: *Medical equipment, *Sampling, *Urinalysis, Clinical medicine, Equipment specifications, Optimization, Performance tests.

For abstract, see STAR 1321

N75-30798/3GA PC$5.75/MF$2.25
Telecare, Inc., Houston, Tex.
Portable Medical Status System.
Final Report.
Aug 75, 142p NASA-CR-144411
Contract NAS9-14334

Descriptors: *Circuit diagrams, *Engineering drawings, *Medical equipment, Equipment specifications, Performance tests, Portable equipment.

For abstract, see STAR 1321

ORNL-TM-3901 PC$10.25/MF$2.25
Oak Ridge National Lab., Tenn.
Blood Cell Separator Development for In Vivo Leukapheresis: A Critical Analysis.
J. P. Breillatt, C. Remenyik, and W. K. Sartory. Oct 72, 141p

Descriptors: (*Blood cells, *Separation processes), (*Leukocytes, Separation processes), (*Erythrocytes, Separation processes), (*Centrifuges, *Efficiency), Centrifugation, In vivo, Mathematical models, Rotors, Sedimentation, Specifications.

For abstract, see NSA 32 08, number 19832.

PAT-APPL-460 323/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
A process for Making a Molded Valve Housing for a Prosthetic Limb.
Patent Application,
Gene Helmuth, and Harry Hughes. Filed 12 Apr 74, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Prosthetic devices, *Artificial limbs, *Medical equipment, *Housings(Enclosures), Patents, Moldings, Valves.
Identifiers: PAT-CL-264-313, *Patent applications.

The patent application discloses a process for making a molded valve housing for a prosthetic socket. The prior method for making a molded housing for a prosthetic socket required the use of a male and female mold. This method did not provide a proper color or texture since the same material which was used for the socket could not be used in the conventional male/female mold process.

PAT-APPL-465 800/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Ophthalmodynamometer.
Patent Application,
Gloria T. Chisum, and John Nichparenko. Filed 1 May 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Medical equipment, Patents, Retina, Blood pressure, Eye, Measuring instruments, Bioinstrumentation.
Identifiers: *Patent applications, *Ophthalmodynamometer.

The patent application discloses a portable ophthalmodynamometer, which operates in the active compression mode and includes a transparent plastic eyecup or speculum attached to a bellows-like bladder having glass endwalls. The eyecup fits under the eyelids and is seated against the sclera by a headstrap attached to the bladder structure and secured around the head. An air duct extends from the interior of the bladder structure to a hand squeeze bulb whereby manipulation of the bulb increases the internal pressure of the bladder structure. Increasing bladder pressure is transmitted to the eyeball via the eyecup to thereby raise intraocular pressure. Bladder pressure is related to retinal artery blood pressure. Means are provided to ascertain the bladder pressure so that retinal artery blood pressure may be determined.

PAT-APPL-465 978/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Ophthalmodynamometer.
Patent Application,
Michael S. Yablonski, and John Nichparenko. Filed 1 May 74, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Medical equipment, Measuring instruments, Patents, Retina, Blood pressure, Eye, Bioinstrumentation.
Identifiers: *Patent applications, *Ophthalmodynamometer, PAT-CL-128-2.

The patent application discloses an ophthalmodynamometer which includes an inflated toroid member attached to an eye speculum having a viewing port. The eye of the toroid and the viewing port are axially aligned to permit the fundus of the eye to be illuminated and viewed. Pressure applied to the toroid member is transmitted to the eyeball to thereby raise intra-ocular pressure. Internal toroid member pressure is related to retinal artery blood pressure. Means are provided to ascertain the toroid member pressure so that retinal artery blood pressure may be determined.

PAT-APPL-577 525/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Process for Fabricating Ceramic Bone Implant and Product Thereof.
Patent Application,
J. J. Klawitter. Filed 14 May 75, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ceramic materials, *Bones, Patents, Implantation, Fabrication, Aluminum compounds.
Identifiers: *Patent applications, PAT-CL-128-92-C, Aluminum oxide.

The patent application discloses a technique for producing a ceramic bone implant of high aluminum oxide material having a high degree of controlled pore structure suitable for accepting bone tissue ingrowth. A high porosity, fully reticulated polymeric sponge is infiltrated by a viscous slip of high aluminum oxide ceramic material having a foaming agent and catalyst therein; the slip is then foamed by controlled decomposition of the foaming agent. The material is dried slowly to prevent skrinkage cracks and is then sintered.

UCRL-76740 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Automated Sample Changer for X-Ray Fluorescence Analysis of Bio-Medical Samples.
D. C. Camp, A. L. Voegele, R. D. Friesen, L. Kaufman, and B. Hruska. 22 Jul 75, 15p

Descriptors: (*X-ray fluorescence analyzers, Sample changers), (*Sample changers, *Design), Automation, Operation, Tissues.

For abstract, see NSA 32 08, number 19533.

6M. Microbiology

AD-A016 128/1GA PC$3.25/MF$2.25
Rhode Island Univ Kingston Dept of Plant Pathology-Entomology
Biodegradation of Alpha TNT and Its Production Isomers.
Interim rept. Jul 73-Jul 74,
Richard W. Traxler. Jul 74, 25p NDC-TR-75-113-FSL
Contract DAAG17-73-C-0276

Descriptors: *TNT, *Biodeterioration, Metabolism, Bacteria, Molecular isomerism, Wastes(Industrial), Explosives.
Identifiers: Nitro compounds, Industrial waste treatment, Biological industrial waste treatment, *Microbial degradation, Heterotrophy.

Gram negative bacteria have been isolated from several sources which use 2,4,6-trinitrotoluene (alpha-TNT) as the sole source of carbon and nitrogen for growth. There is a direct relationship between the alpha-TNT concentration in the growth medium and growth response of isolate I-2WT as well as the percentage of TNT degradation by this organism. Studies using ring UL-14C-TNT suggested possible ring cleavage (biodegradation) of TNT as 14C activity was released as carbon dioxide and also found in the cells. Heterotrophic carbon dioxide fixation was demonstrated using NaH(14)CO3 added to a culture growing on unlabeled TNT.

AD-A016 172/9GA PC$3.75/MF$2.25
Hadassah Medical School Jerusalem (Israel) Dept of Protozoology
The Integration of Cellular and Humoral Responses to Protozoan Parasites.
Final rept. Aug 74-Jul 75,
Avivah Zuckerman, Charles L. Greenblatt, and Dan T. Spira. Jul 75, 37p
Grant DA-ERO-591-73-G0045
See also report dated Jul 73, AD-769 946.

Descriptors: *Immunology, *Plasmodium, *Leishmania, *Protozoa, *Parasites, Cultures(Biology), Serology, Immunity, Cells(Biology), Spleen, Malaria, Rats, Mice, Parasitic diseases, Experimental data, Hypersensitivity, Israel.
Identifiers: Plasmodium berghei, Leshmania tropica.

The immunological mechanisms acting against the infection of rats with Plasmodium berghei and of mice infected with Leishmania tropica have been studied. In addition a system of serotyping of leishmania strains, using their excreted factor (EF) and of growing amastigotes in culture have been developed. Spleen cells of rats during the acute stage of the infection with P.berghei vigorously incorporate radioactive thymidine immediately after they are transferred into culture. But when stimulated with nonspecific mitogens they are practically unresponsive. In contrast, spleen cells of rats recovered from the disease are effective in adoptive transfer of immunity against the infection. Leishmania tropica produces a transient cutaneous infection in C3H mice, similar to the lesion found in man. The dynamics of the disease and the possibilities of adoptive transfer of immunity and of delayed hypersensitivity have been studied.

N75-30768/6GA PC$3.75/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Species of Fungi of the Hygrophoraceae Family on the Velka Horka Hill Near Mnichovo Hradiste.
J. Herink. Sep 75, 49p NASA-TT-F-16492
Contract NASW-2790
Tran-Transl. Into English from Acta Musei et Horti Balamci Bohemia Borealis, SB. Severoceskeho Musea. Liberec. Sb. Severecesk Mus. Prirodinivedy (Czechoslovakia), V. 195, 1958 p 53-86.

Descriptors: *Czechoslovakia, *Forests, *Fungi, Basalt, Microspores, Plants (Botany).
Identifiers: Translations.

For abstract, see STAR 1321

6O. Pharmacology

AD-A015 992/1GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Pharmacokinetic Rationale for a Malarial Suppressant Administered once Monthly.
Final rept.,
C. C. Peck, A. N. Lewis, and B. E. Joyce. 16 May 74, 9p Rept no. LAIR-76-002
Availability: Pub. in Annals of Tropical Medicine and Parasitology, v69 n2 p141-146 1975.

Descriptors: *Antimalarials, Long life, Pyrimethamine, Dosage, Frequency, Concentration(Chemistry), Life expectancy, Half life, Elimination, Humans, Reprints.
Identifiers: *Sulfadoxine.

Serum was collected from six adults participating in a field trial of sulfadoxine and pyrimethamine in combination which was being administered once monthly for malaria suppression. Samples were drawn during each of two consecutive months three hours, and 7, 14 and 28 days following a dose of 1 500 mg sulfadoxine and serum sulfadoxine concentration was measured. Initial serum concentrations averaged 19.9 + or - 2.4 (SD) mg/100 ml and decayed to 6.2 + or - 2.8 mg/100 ml at 14 days. Serum sulfadoxine concentrations were still detectable at 28 days following a dose (2.1 + or - 1.5 mg/100 ml). Elimination half-time

averaged 195 + or - 44 hours. The persistent serum concentrations of sulfadoxine following monthly doses during field-use of this drug are in agreement with successful clinical results previously reported.

AD-A015 993/9GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Improved Computer-Assisted Digoxin Therapy -- A Method Using Feedback of Measured Serum Digoxin Concentrations.
Final rept.,
Lewis B. Sheiner, Hillel Halkin, Carl Peck, Barr Rosenberg, and Kenneth L. Melmon. 3 Jul 74, 12p Rept no. LAIR-76-004
Availability: Pub. in Annals of Internal Medicine, v82 n5 p619-627 May 75.

Descriptors: *Cardiac glycosides, Feedback, Chemotherapy, Computer applications, Blood chemistry, Dosage, Automation, Concentration(Chemistry), Mathematical prediction, Computer programming, Computerized simulation, Accuracy, Validation, Reprints.
Identifiers: Digoxin.

Automated feedback control methods were applied to a medical problem, in a computer program that used measured serum digoxin concentrations (as feedback) to predict future concentrations and to achieve desired concentrations. The system was validated by comparing its ability with the corresponding ability of physicians to regulate digoxin dosage. The prospective, randomized study included 51 patients. In the presence of varying amounts of feedback (serum digoxin concentration) information, the computer always predicted future digoxin concentrations as accurately as did physicians. For both computer and physician, the decrease in the prediction errors when two concentrations were known against that when no concentrations were known was significant: mean absolute error decreased from 0.40 to 0.25 ng/ml for the physicians and from 0.45 to 0.27 ng/ml for the computer. Thus, the computer system is capable of simulating and reproducing a sophisticated aspect of physician behavior: 'learning' about individual patient responses. The computer achieved desired concentrations more accurately than did physicians, especially when two or more previous digoxin concentrations were available (mean absolute achievement error for computer, 0.28 ng/ml; for physicians, 0.50 ng/ml). (Author)

AD-A016 107/5GA PC$4.25/MF$2.25
Sidney Farber Cancer Center Boston Mass Labs of Bioorganic Chemistry
Analogs of Cordycepin and Adenine Arabinoside (Ara-A) as Potential Antimalarial Nucleosides.
Annual rept. 1 Jun 74-31 May 75,
Andre Rosowsky, and Edward J. Mosest. Jun 75, 55p
Contract DAMD17-74-C-4105

Descriptors: *Antimalarials, Drugs, Synthesis(Chemistry), Nucleosides, Pharmacology, Bioassay, Mice.
Identifiers: *Cordycepin, *Adenine/arabinosyl.

Research has been devoted to the synthesis of 3'-C-alkyl analogs of the nucleoside antibiotic cordycepin as potential antimalarial agents with enhanced lipophilicity, improved membrane transport properties, and resistance to inactivation by adenosine deaminase. In part, the work has also been concerned with the synthesis of ester and amide derivatives of ara-A 3',5'-cyclic phosphate, in which passive transport of the drug into cells in intended to be facilitated via increased lipophilicity. Twenty compounds, of which four were target compounds of the 3'-C-alkylcordycepin type, were submitted to WRAIR for antimalarial evaluation.

AD-A016 207/3GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
The Unlabeled Antibody Enzyme Method of Immunocytochemistry, Quantitative Comparison of Sensitivities with and without Peroxidase-Antiperoxidase Complex.
Special publication Oct 73-Jun 74,
Ludwig A. Sternberger, John P. Petrali, Dennis M. Hinton, and Gwen C. Moriarty. 19 Oct 73, 26p Rept no. EB-SP-75002
Availability: Pub. in Jnl. of Histochemistry and Cytochemistry, v22 n8 p782-801 1974.

Descriptors: *Antibodies, *Enzymes, *Antigens and antibodies, *Pituitary hormones, Peroxidases, Sensitivity, Quantitative analysis, Rats, Reprints.
Identifiers: *Immunocytochemistry.

Araldite sections of rat pituitary intermediate lobe were used with anti-(17-39)adrenocorticotorpin in the unlabeled antibody enzyme method to compare electron microscopic immunocytochemical staining by peroxidase-antiperoxidase complex (PAP) with antiserum or purified antibody to peroxidase followed by peroxidase. (PO). Quantitation of normalized optical densities of secretory granules offered high significance comparison ($P<0.0001$) of experimental with control values and of experimental values with each other. Use of purified antibody (prepared by a new density gradient method) yielded four times higher sensitivity than antiserum to PO, while a 6.5-fold increase would have been expected from the degree of contamination of anti-PO in the serum by nonanti-PO immunoglobulin. Use of PAP was four to five times more sensitive than purified anti-PO and 20 times more sensitive than antiserum to PO. The increased sensitivity of PAP is explained by the high over-all binding affinity of PO for anti-PO in the cyclic PAP molecule, thus preventing the losses of PO that occur during washing when anti-PO and PO have been applied in sequence. Identification of the characteristic, cyclic PAP molecules affords confirmation of specific staining at high resolution. In the sequential application of anti-PO and PO, no PAP molecules are formed, thus making distinction of specific from nonspecific deposition of enzyme reaction products ambiguous. With the use of anti-(17-39) ACTH and the intermediate lobe, the unlabeled antibody enzyme method was 16,000-100,000 times more sensitive than radioimmunoassay. (Author)

N75-30776/9GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Effect of Exogenous Catecholamines on Heart Rate and Thermoregulation in the Hibernating Hedgehog (Erinaceous Europaeus L)..
A. Faure, and M. Fontaine. Aug 75, 10p NASA-TT-F-16533
Contract NASW-2790
Tran-Transl. Into English from Compt. Rend., Acad. Des Sci. (Paris), Ser. D, V. 280, 9 Jun. 1975 p 2559-2562.

Descriptors: *Heart rate, *Hibernation, *Mammals, *Norepinephrine, *Thermoregulation, Inhibition, Physiological effects, Stimulant.
Identifiers: Translations.

For abstract, see STAR 1321

6P. Physiology

AD-A015 732/1GA PC$3.75/MF$2.25
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Effects of Sustained Talking on the Hearing of the Talker,
Charles W. Nixon. Aug 75, 25p Rept no. AMRL-TR-75-39

Descriptors: *Hearing, *Speech, Intensity, Auditory acuity, Sensitivity, Losses, Thresholds(Physiology), Fatigue(Physiology), Deafness, Psychoacoustics, Volume, Continuity, Time dependence, Self noise, Audiometry.
Identifiers: Loudness.

The effects on hearing sensitivity of loud talking at 90 dBC for brief durations of 3 to 12 minutes and of sustained talking at 65 DB(A) and 75 dB(A) for periods of 30 to 120 minutes were measured. Loss of hearing sensitivity following speech exposure sessions were attributed to the talking. Results of three studies contained in the report include: (1) Self-generated speech at a level of about 90 dB(C) produced small decreases of 2 to 6 dB in hearing threshold sensitivity following 3 to 12 minute periods of talking; (2) Continuous talking for periods of 30 to 120 minutes at levels of about 65 dB(A) had no effect on the hearing of the talker and (3) sustained speech, either self-generated or presented by loudspeaker, at voice levels of 65 dB(A) and 75 dB(A) for continuous periods up to 120 minutes had no effect on the hearing of the subject. (Author)

AD-A015 994/7GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
Morphology of Stored, Rejuvenated Human Erythrocytes.
Final rept.,
Robert T. Usry, Gerald L. Moore, and Fred W. Manalo. 22 Mar 74, 11p Rept no. LAIR-76-005
Availability: Pub. in Vox Sang, 28 p176-183 1975.

Descriptors: *Erythrocytes, *Blood preservation, Metabolism, Morphology(Biology), Additives, Phosphates, Inosine, Glucose, Pyruvates, Adenine, Humans, Adenosine phosphates, Fresh, Recovery, Storage, Reprints.
Identifiers: Rejuvenation.

Whole blood was stored at 4C for 42 days. At 7-day intervals, starting with day 21, aliquots were rejuvenated with a phosphate, inosine, glucose pyruvate, and adenine solution. Samples were taken for ATP assays and red cell morphology (by SEM) both before and after rejuvenation. Rejuvenation elevated all ATP levels in excess of 100% of the starting values and significantly increased the percent of cells in the discoid shape as measured by their morphological index, showing that rejuvenation not only raises the cell's metabolic level but causes partial reversion to fresh cell morphology. (Author)

AD-A015 997/0GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
In Vitro Metabolism of Packed Erythrocytes Stored in CPD-Adenine.
Final rept. Mar-Apr 75,
T. A. Bensinger, J. Metro, and E. Beutler. 26 Aug 74, 8p Rept no. LAIR-76-009
Availability: Pub. in Transfusion, v15 n2 p135-139 Mar-Apr 75.

Descriptors: *Erythrocytes, *Blood preservation, Metabolism, Adenosine phosphates, Preservatives, Adenine, Glucose, Concentration(Chemistry), Maintenance, Hematocrit, Citrates, Phosphates, Storage, Packing density, Viability, Reprints.
Identifiers: Adenosine triphosphate, CPD(Citrate phosphate dextrose), Dextrose.

In vitro metabolism of erythrocytes packed at 70 and 90 per cent hematocrits and stored in various CPD-adenine preservatives was studied. It was found that maintenance of acceptable levels of adenosine triphosphate (ATP) for the full 42 days of storage could be accomplished only if glucose levels were doubled from the standard 138.7 mM concentration to 277.5 mM level. If glucose levels were doubled, the

amount adenine could be decreased from 4.07 mM (0.50 mM final concentration) to 2.04 mM (0.25 mM final concentration) with maintenance of ATP at greater than 2.0 micromoles/g Hb. 2,3-diphosphoglycerate concentrations were essentially absent by 21 days in the various media studied. Thus, in vitro levels of ATP appear to be maintained at acceptable levels in a CPD media modified to contain 2 x glucose and 2.04 mM adenine. (Author)

AD-A016 005/1GA PC$3.75/MF$2.25
Naval Health Research Center San Diego Calif
Sleep,
L. C. Johnson. 1975, 31p Rept no. 73-31
Availability: Pub. in Research in Psycho-Physiology, p125-152 1975.

Descriptors: *Sleep, *Psychophysiology, Response(Biology), Electroencephalography, Brain, Information processing, Humans, Eye movements, Awareness, Thresholds(Physiology), Reprints.
Identifiers: Wakefulness, Drowiness, Arousal, Orienting response.

This review paper summarizes the advantages of the state of sleep for research in psychophysiology. The difficulties of evaluating data obtained during sleep are also discussed. Information processing during sleep is summarized. Published reports lead to the conclusion that the sleeping brain does receive, process, and perhaps even store information presented during sleep. There are no data to indicate, however, that the information stored during sleep can be retrieved during waking. The orienting response is used as an example of a research problem studied during sleep.

AD-A016 006/9GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Common Mode Rejection Techniques in Conjugate Eye Movement Recording during Sleep,
David Hord. 10 May 74, 4p Rept no. 74-44
ARPA Order-1596
Availability: Pub. in Psychophysiology, v12 n3 p354-355 1975.

Descriptors: *Electrooculography, *Eye movements, Electroencephalography, Sleep, Signal to noise ratio, Amplifiers, Rapid eye movement in sleep, Recording systems, Biology, Reprints.
Identifiers: Differential amplifiers, Conjugate eye movements.

Common mode rejection is viewed as a general technique that can be used in certain biological recording situations to increase the signal to noise ratio, in which the noise component is of biological rather than electrical origin. The recording of conjugate eye movements during sleep is cited as an example. (Author)

AD-A016 043/2GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Cardiac Output and Central Blood Volume as a Function of Body Weight in the Baboon.
1971, 7p
Pub. in Transactions Illinois Academy of Science, p207-211 1971.

Descriptors: *Body weight, *Blood volume, *Cardiovascular system, Physiology, Blood circulation, Blood pressure, Baboons, Laboratory animals, Experimental data.

The relationship between cardiac output and central blood volume as a function of body weight was investigated in tranquilized adult baboons. Cardiac output was determined by the dye dilution method. Central blood volume was calculated as the product of cardiac output, and mean transit time. It was concluded, that weight raised to the .62 power offers a slight improvement in comparing cardiac outputs between animals of different sizes. A simple weight index for central blood volume should be a satisfactory expression for the parameter.

AD-A016 044/0GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Coagulation Changes of Hemorrhagic and Septic Shock in Baboons.
1970, 18p
Pub. in Reversibility of Cellular Injury due to Inadequate Perfusion, ch34 p443-458 n.d.

Descriptors: *Shock(Pathology), *Blood coagulation, *Hemorrhagic shock, *Endotoxic shock, Endotoxemia, Septicemia, Pathology, Physiology, Baboons, Experimental data, Escherichia coli, Coliform bacteria, Dosage, Laboratory animals.
Identifiers: Animal models.

There is a lack of agreement concerning the nature and physiologic significance of changes in the blood coagulation system during shock. Much of the uncertainty is based on the differences among the clinical and animal conditions in which these changes have been studied. The authors studied the coagulation responses to hemorrhagic and gram-negative septic shock. In order to avoid the splanchnic vascular response of the dog, with the possible resultant endotoxemia which could complicate the picture of hemorrhagic shock, the baboon was used as a subhuman primate model. The resemblance of the baboon blood coagulation system to that of man offered an additional advantage of the use of that species.

AD-A016 190/1GA PC$3.25/MF$2.25
Armed Forces Radiobiology Research Inst Bethesda Md
The Influence of a Granulocytic Inhibitor (Chalone) on Hematopoiesis in an 'in vivo' Culture System.
Scientific rept.,
T. J. MacVittie, K. F. McCarthy, and E. G. McCarthy. Jun 75, 22p Rept no. AFRRI-SR75-15

Descriptors: *Granulocytes, *Blood cells, Bone marrow, Inhibitors, Mitosis, In vivo analysis, Cultures(Biology), In vitro analysis.
Identifiers: *Chalone.

The in vivo diffusion chamber (DC) technique for mouse marrow culture was used to determine the effect of a granulocyte inhibitor (chalone) on the proliferation of the pluripotent stem cell (CFU-S) and the granulocyte progenitor cell (CFU-C). The DC's were each inoculated with a normal mouse marrow suspension and then implanted into host mice exposed four hours previously to 900 rads 60Cogamma-radiation. Granulocyte inhibitor (chalone) containing solution was collected as the 20-hour incubation media of rat granulocytes previously obtained by peritoneal lavage. The granulocytic inhibitor was injected intraperitoneally in 1.5-ml aliquots into chamber-bearing mice at 5, 20, 24, 28, 44 and 48 hours after implanation. This regimen resulted in a significantly reduced number of granulocytic progeny formed within the DC's while there was no growth inhibition of mouse fibroblast cultured under identical conditons. The reduced cell production was due in part to a significant reduction in the self-renewal rate of the CFU-C while no apparent direct effect was observed upon the growth of the CFU-S within the same cultures.

AD-A016 195/0GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
The Prediction of Maximal Oxygen Consumption--A Comparison of the Bruce and Balke Treadmill Protocols,
Victor F. Froelicher, Audrey J. Thompson, Ignacio Noguera, Garland Davis, and Alderus Stewart. 14 Nov 74, 9p Rept no. SAM-TR-74-377
Availability: Pub. in Chest, v68 n3 p331-336 Sep 75.

Descriptors: *Oxygen consumption, *Exercise(Physiology), Mathematical prediction, Acceptability, Least squares method, Performance(Human), Males, Time studies, Physiological effects, Heart function tests, Cardiovascular system, Physical fitness, Correlation techniques, Nomographs, Linear regression analyses, Validation, Reprints.
Identifiers: Treadmills, Age, Walking.

This study investigated the hypothesis that an individual's maximal oxygen consumption can be realistically predicted by the maximal time achieved in the Balke or Bruce treadmill protocols. Also, the range of maximal oxygen consumptions that can be expected for healthy individuals of any given age and activity habit was evaluated. The maximal oxygen consumptions achieved by one group of men exercised using the Balke protocol and another group using the Bruce protocol were linearly regressed by a least-squares fit technique on maximal treadmill time and on age with activity status classified. Statistical analysis demonstrated an inadequate relationship for predicting maximal oxygen consumption from maximal treadmill time using both protocols. Also, maximal oxygen consumption poorly correlated with age even though activity status was considered. These findings make the nomogram for predicting an individual's functional aerobic impairment a clinical technique of questionable value. Before the prediction of functional aerobic impairment from exercise duration, age, and activity status becomes an accepted clinical tool, other investigators should validate it. (Author)

AD-A016 199/2GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Control of Ventilation in Underwater Swimmers: The Effect of Intermittent Exposure to Hyperbaric O2.
Medical research progress rept.,
Leon J. Greenbaum, Jr., Delbert Evans, and Nicholas R. Anthonisen. 1971, 6p
Availability: Pub. in Aerospace Medicine, v42 n1 p9-12 Jan 71.

Descriptors: *Ventilation(Physiology), *Swimmers, Oxygen consumption, Hyperbaric conditions, Respiration, Oxygen, Hyperoxia, Carbon dioxide, Concentration(Chemistry), Mixtures, Response(Biology), Scuba divers, Closed cycle systems, Reprints.
Identifiers: Rebreathing systems.

The effect of intermittent high pressure O2 breathing on the chemical control of ventilation was studied in 8 trained underwater swimmers. The ventilatory responses to CO2, 12% O2 and 100% O2 were noted before and after a period of daily long distance swims using closed circuit SCUBA. Neither CO2 nor O2 responses were significantly altered by the training. CO2 responsiveness varied widely among the swimmers and did not appear to be related to diving experience. (Author)

AD-A016 201/6GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Variation in Urinary Creatinine Excretion and Its Relationship to Measurement of Urinary 17-Hydroxycorticosteroids.
Medical research progress rept.,
Philip E. Cryer, and Jonas Sode. 22 Jul 70, 6p
Availability: Pub. in Clinical Chemistry, v16 n12 p1012-1015 1970.

Descriptors: *Urinary system, *Creatinine, *Urine, *Excretion, Corticosteroid agents, Measurement, Reprints.
Identifiers: Hydroxycorticosteroids, 17-hydroxycorticosteroids.

Urinary creatinine excretion, measured in 96 24-h urine specimens collected from a single subject was less variable (CV, 9.3%) than daily urine volume (CV, 20.7%). However, a small variation in measured creatinine excretion did exist, since the observed CV of 9.3% was not explicable either on the basis of analytical error (CV for replicate determinations, 1.1%) or of collection error. Thus, 24-h urinary creatinine excretion is not constant. On the other hand, demonstrated variation in creatinine excretion was small, and urinary 17-hydroxycorticosteroids could be validly expressed in mg/g of creatinine. In a given individual, biologic variation in 24-h creatinine excretion is negligible as compared with variation in 17-hydroxycorticosteroid excretion. (Author)

AD-A016 202/4GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Myxosarcoma in a Young Rhesus Monkey,
J. B. Moe, J. D. White, W. P. Czajkowski, and J. L. Stookey. 1975, 7p
Availability: Pub. in Veterinary Pathology, 12 p6-12 1975.

Descriptors: *Sarcoma, Pelvis, Rhesus monkeys, Youth, Histology, Pathology, Electron microscopy, Veterinary medicine, Reprints.
Identifiers: *Myxosarcoma.

A myxosarcoma that arose spontaneously in the ilial region of a young male Rhesus monkey grew rapidly and invaded and lysed the pelvic bones. It consisted of large pleomorphic cells, with single or multiple nuclei and dilated rough endoplasmic reticulum, in abundant intercellular matrix. (Author)

AD-A016 203/2GA PC$3.225/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Interference Between Virulent and Vaccine Strains of Venezuelan Encephalitis Virus in Mixed Infections of Hamsters,
P. B. Jahrling. 4 Sep 74, 8p
Availability: Pub. in Jnl. of General Virology, 29 p1-8 1975.

Descriptors: *Vaccines, *Interferon, Venezuelan equine encephalomyelitis virus, Inoculation, Strains(Biology), Spleen, Bone marrow, Hamsters, Sensitivity, Infections, Lethality, Inhibition, Virulence, Reduction, Reprints.

Hamsters inoculated with the TC-83 vaccine strain of Venezuelan encephalitis (VEE) virus were protected against a normally lethal challenge by virulent VEE virus, strain 68U201, inoculated 30 h after vaccination. Protection was correlated with significantly decreased levels of challenge virus in target tissues (spleen and bone marrow). Inhibition of challenge virus replication was correlated more closely with the interferon concentrations in spleen and bone marrow than with the vaccine virus infectivities in these tissues at the time of challenge. The induction of early defence mechanisms involves the efficient interaction of virus with the spleen; although this interaction is more efficient for TC-83 vaccine, virulent VEE viruses are sensitive to the induced protective mechanism. Interferon appears to be a mediator of this mechanism. (Author)

AD-A016 208/1GA PC$3.25/MF$2.25
Navy Experimental Diving Unit Panama City Fla
Thermal Homeostasis of Resting Man in Helium-Oxygen at 1-50 Atmospheres Absolute,
L. W. Raymond, E. Thalmann, G. Lindgren, H. C. Langworthy, and W. H. Spaur. Aug 74, 21p Rept no. NEDU-8-75
Availability: Pub. in Undersea Biomedical Research, v2 n1 p51-67 Mar 75.

Descriptors: *Homeostasis, *Hypothermia, *Body temperature, Divers, Rest, Hyperbaric chambers, Helium, Oxygen, Mixtures, Partial pressure, Thermal stresses, Convection(Heat transfer), Males, Rectum, Skin(Anatomy), Genital tracts, Underwater structures, Habitability, Mathematical models, Reprints.
Identifiers: Scrotal temperature, Rectal temperature.

Spaur (1974) showed that man can work effectively and live comfortably for 7 days in helium-oxygen at 49.5 ATA, a pressure equivalent to 1600 ft (488 m) sea water. Two of his six male subjects were studied during habitation at and decompression from this pressure, in hyperbaric chambers with an O2 pressure of 0.30-0.35 ATA. To avoid thermal stress during the 32 day exposure, ambient temperature was maintained at 30-32 C (86-89 F). Relative humidity was 68-74%, and there was no measurable velocity. Comfort and thermal balance were adequate during mild activity when the men wore swim trunks and cotton jersey shirts. When they were seated without shirts, their rectal temperature fell during 2-hr observation periods at depths greater than 800 fsw, while skin temperature and oxygen consumption remained normal, and scrotal temperature increased. The fall in rectal temperature during rest appeared to be due more to skin convection than to respiratory heat loss, and the coefficient of cutaneous convection could be expressed in a form similar to that suggested by Varene, et al. (1972).

CEA-N-1778 PC$6.75/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Services d'Electronique.
An on-Line Real Time Spike Recognition System in Multiple Unit Extracellular Records.
F. Dupoirier. Dec 74, 75p
In French. U.S. Sales Only.

Descriptors: (*Nerve cells, *Pulses), Computers, Data processing, On-line systems.

For abstract, see NSA 3208

N75-30775/1GA PC$6.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Mapping of Individual Circadian Rhythm.
O. Oequist. Aug 75, 160p NASA-TT-F-16502
Contract NASW-2483
Tran-Transl. Into English from Univ. Of Goeteborg (Sweden) Thesis, Jul. 1970 p 1-128.

Descriptors: *Circadian rhythms, *Human behavior, *Human performance, Age factor, Physiological factors, Psychological factors.
Identifiers: Translations.

For abstract, see STAR 1321

6Q. Protective Equipment

AD-A015 734/7GA PC$3.25/MF$2.25
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
Wind Tunnel Tests of a USAF Flight Helmet and Loss Preventer.
Interim rept. Oct 73-Oct 74,
James W. Brinkley. Aug 75, 15p Rept no. AMRL-TR-75-75

Descriptors: *Flight helmets, *Ejection seats, Aerodynamic forces, Flight crews, Losses, Retention(General), Pilots, Blast, Wind velocity, Escape systems, Spoilers, Pitch(Motion), Yaw, Wind tunnel tests, Volunteers, Aerodynamic loading.
Identifiers: Flailing, ACES(Advanced Concept Ejection Seat), Advanced concept ejection seat.

An experimental effort was accomplished to measure the aerodynamic forces that act upon a crewman's flight helmet during use of an aircraft emergency escape system. Tests were accomplished within a low speed wind tunnel using volunteer subjects seated within an ACES II escape system. The wind velocity was varied to produce dynamic pressures ranging from 10 to 50 lb per sq ft. The pitch angle of the seat and subject were varied -2 to +73 degs. The yaw angle was varied from 0 to 30 degs. (Author)

PAT-APPL-463 944/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Custom Fitted Lightweight Air Conditioned Protective Helmet.
Patent Application,
Gloria T. Chisum. Filed 25 Apr 74, 17p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Helmets, Patents, Pilots, Linings, Insulation, Weight.
Identifiers: PAT-CL-2-6, *Patent applications.

The patent application concerns a lightweight helmet which can be custom fitted to a pilot's head and can be formed in the field by an in situ foaming process. The helmet liner contains air ducts integrated with the foamed structure through which cooling air can be passed to keep the pilot's head at a comfortable temperature. Such a lightweight, air cooled, form fitting helmet will keep a proper attitude on the pilot's head during all aircraft maneuvers.

6R. Radiobiology

AD-A015 622/4GA PC$3.25/MF$2.25
Naval Medical Research and Development Command Bethesda Md
Bibliography of Reported Biological Phenomena (Effects) and Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation. Supplement Number 6.
Medical research interim rept.,
Zorach R. Glaser. Jun 75, 21p
Supplement to AD-784 007.

Descriptors: *Radiobiology, *Radiofrequency, *Bibliographies, Electromagnetic radiation, Radiation effects, Medical research, Radio waves, Radiation hazards, Humans.
Identifiers: *Microwave radiobiology, *Electromagnetic radiation hazards.

Almost 250 additional references on the biological responses to radio frequency and microwave radiation, published up to June 1975, are included in this bibliography of the world literature. Particular attention has been paid to the effects of non-ionizing radiation on man at these frequencies. The citations are arranged alphabetically by author (where possible), and contain as much information as possible so as to assure effective retrieval of the original documents. Soviet and East European literature is included in detail.

AD-A015 943/4GA PC$3.75/MF$2.25
Texas Univ At Austin Electronics Research Center
Threshold Lesion Temperatures in Laser-Irradiated Rabbit Eyes.
Technical rept.,
G. D. Polhamus, and A. J. Welch. 31 Mar 75, 40p Rept no. TR-168 AFOSR-TR-75-1271
Contract F44620-71-C-0091

Descriptors: *Eye, *Radiation injuries, *Retina, Ophthalmology, Temperature, Thresholds(Physiology), Rabbits, Laboratory animals, Radiobiology, Radiation effects.
Identifiers: *Laser radiobiology.

The purpose of this research was to measure threshold temperatures corresponding to the formation of minimum ophthalmoscopically

visible lesions induced in rabbit fundi by a ten-second exposure from an argon C. W. laser (4880A). The posterior pole of the eye was surgically exposed and a specially designed microthermocouple with a 20-micron diameter tip was inserted into the ocular fundus to measure temperature rises. The mean threshold temperature for 30 measurements in 13 rabbits was 54C. System error was estimated at 5% of temperature rise, or slightly less than 1C.

AD-A016 091/1GA PC$5.25/MF$2.25
Advisory Group for Aerospace Research and Development Paris (France)
Laser Hazards and Safety in the Military Environment.
Lecture series.
Aug 75, 106p Rept no. AGARD-LS-79
Presented at a Lecture Series in Germany (22-23 Sep 75), the Netherlands (25-26 Sep 75) and Norway (1-2 Oct 75). NATO furnished.

Descriptors: *Lasers, *Military applications, *Radiation effects, *Health physics, Environments, Hazards, Safety, Eye, Ophthalmology, Irradiation, Reviews, Radiobiology, Skin(Anatomy), Protective equipment, Electromagnetic radiation, Industrial medicine, NATO.
Identifiers: Laser radiobiology.

The Lecture Series is intended to provide an understanding of the safety problems associated with the military use of lasers. The most important hazard is the inadvertent irradiation of the eye and so the series will include contributions from the physical and biological sciences, as well as from ophthalmologists. Those involved with laser safety come from many backgrounds -- from physics to engineering and from vision physiology to clinical ophthalmology and it is essential that each understands the contribution of the other. The lectures include an introductory part and from this, the more advanced aspects of each subject are covered, leading to the issues involved in the design of safety codes and the control of laser hazards. The final session deals with medical surveillance of laser personnel. The Series is of value to both military and civilian personnel involved with safety, whether they are concerned with land, sea or airborne laser systems.

AD-A016 193/5GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Ocular Tissue Damage Due to Ultrashort 1060-nm Light Pulses from a Mode-Locked Nd-Glass Laser.
Interim rept. Oct 73-Jul 74,
John Taboada, and Robert W. Ebbers. 9 Sep 74, 5p Rept no. SAM-TR-75-275
Availability: Pub. in Applied Optics, v14 n8 p1759-1761 Aug 75.

Descriptors: *Radiation effects, *Retina, Neodymium lasers, Lesions, Rhesus monkeys, Eye, Damage, Glass lasers, Mode locked lasers, Q switching, Short pulses, Exposure(Physiology), Low energy, YAG lasers, Reprints.

A study is reported of the ocular tissue damage effects of short trains of 1060 nm wavelength ultrashort laser radiation pulses. The macular sites of 46 retinae of anesthetized rhesus primates (Macaca mulatta) were exposed to single trains of picosecond pulses. The ultrashort pulse trains were obtained from a Nd-glass laser simultaneously Q-switched and mode-locked by means of an intracavity saturable absorber. The mode-locked laser parameters were controlled to yield a single reproducible pulse train containing approximately 13 ultrashort (approximately or equal to 5 ps) pulses of intervals of 6.9 ns. Damage to the retinal tissue was studied by means of a fundus camera. One hour postexposure observations were made to detect the presence or absence of lesions. Results indicate an unusually low value of 2 x 10 to the minus 5th power joules as the total pulse train energy necessary for 50% probability of minimum detectable damage to the macular area in the retina. The energy value is significantly below the energy required to cause damage characterized by the thermal processes as seen at exposure times greater than 1 ns.

AD-A016 194/3GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Ocular Effects of a 325 NM Ultraviolet Laser.
Final rept. Oct 72-May 74,
Robert W. Ebbers, and Daniel Sears. Mar 75, 10p Rept no. SAM-TR-74-350
Availability: Pub. in American Jnl. of Optometry and Physiological Optics, v52, p216-223 Mar 75.

Descriptors: *Radiation effects, *Cornea, Ultraviolet lasers, Helium cadmium lasers, Rhesus monkeys, Lens(Eye), Lesions, Damage, Reversible, Thresholds(Physiology), Dosage, Cataracts, Continuous wave lasers, Reprints.

Corneal exposures were made on 100 eyes of anesthetized rhesus monkeys with a continuous wave HeCd ultraviolet laser at a wavelength of 325 nm. The ED sub 50 corneal damage probability point was determined to be 0.8 joules of energy. This is higher than the levels for damage reported for noncoherent laser sources. However, the endpoint used here was a well-defined circumscribed lesion as contrasted to the appearance of granules used for the broadband, wide-beam, non-coherent studies. The granules were not seen with the narrow band, small beam laser irradiation. Exposures made at eight times the threshold for corneal damage produced lens damage, i.e., cataracts. This represents permanent damage as compared to the corneal damage which at threshold levels is completely reversible in 24-48 hours. (Author)

AD-A016 196/8GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Radiation Protection Considerations in the Cardiac Catheterization Laboratory,
James H. Dunlap. 10 Mar 75, 4p Rept no. SAM-TR-75-240
Availability: Pub. in Health Physics, v29 p415-416 Sep 75.

Descriptors: *Fluoroscopy, *Radiation protection, Radiation shielding, Medical personnel, Patients, Dosimetry, Radiation hazards, Pregnancy, Exposure(Physiology), Heart, Catheters, Reprints.

No abstract available.

AD-A016 255/2GA PC$5.75/MF$2.25
Naval Academy Annapolis Md
The Effect of Extremely Low Frequency Electromagnetic Fields on the Circadian Biorhythms of Swiss Webster Mice.
Research rept.,
Richard E. Gribble, Jr. 23 May 75, 132p Rept no. USNA-TSPR-68
Report on A Trident Scholar Project.

Descriptors: *Electromagnetic fields, *Circadian rhythms, *Biological rhythms, *Radiation effects, Extremely low frequency, Radiobiology, Mice, Laboratory animals, Experimental data, Blood chemistry, Hematology.

Albino Swiss Webster mice were shown to experience alterations in blood chemistry, including circadian rhythm entrainment. Field strengths of 30 volts/meter and 4.0 gauss at the frequency of 45 Hz produced rhythm entrainment in red and white cell counts, as well as hematocrit, haemoglobin, potassium, sodium, and glucose level. Alterations in biorhythms, times of effect, threshold of entraining fields and possible electromagnetic control have been demonstrated.

BNWL-SA-4813 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Dosimetry of the Radioactive Noble Gases.
J. K. Soldat, P. E. Bramson, and H. M. Parker. 1973, 17p CONF-730915-17
Contract AT(45-1)-1830

Descriptors: (*Man, *Dose rates), (*Argon 39, *Radiation dose distributions), (*Argon 41, Radiation dose distributions), (*Krypton 83, Radiation dose distributions), Adipose tissue, Beta sources, Cesium 138, Daughter products, Decay, Environment, External irradiation, Gamma sources, Gases, Inhalation, Internal irradiation, Isomeric nuclei, Krypton 85, Krypton 87, Krypton 88, Lungs, Radiation doses, Radioactive clouds, Radioactive effluents, Radionuclide kinetics, Rubidium 88, Skin, Testes, Whole-body irradiation, Xenon 131, Xenon 133, Xenon 135, Xenon 137, Xenon 138.

For abstract, see NSA 32 08, number 19918.

BNWL-SA-5170 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Disposition of Highly Toxic Radioactive Aerosols Inhaled by Beagle Dogs.
D. K. Craig, J. R. Decker, G. J. Powers, and J. F. Park. 1975, 20p CONF-750707-2
Contract AT(45-1)-1830

Descriptors: (*Americium 241, *Inhalation), (*Curium 244, Inhalation), Beagles, Curium oxides, Excretion, Liver, Lungs, Muscles, Particle size, Radiation dose distributions, Radioactive aerosols, Radionuclide administration, Radionuclide kinetics, Retention, Skeleton, Time dependence, Tissue distribution.

For abstract, see NSA 32 08, number 20016.

BNWL-SA-5296 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Influence of Inhaled Ca-Dtpa on the Long-Term Effects of Inhaled Pu Nitrate.
J. E. Ballou, G. E. Dagle, K. E. McDonald, and R. L. Buschbom. 1975, 15p CONF-750707-4
Contract AT(45-1)-1830

Descriptors: (*Plutonium, *Body burden), (*Dtpa, *Inhalation), (*Rats, *Radionuclide kinetics), Calcium compounds, Lungs, Neoplasms, Pharmacology, Toxicity.

For abstract, see NSA 32 08, number 20017.

CONF-740598-1 PC$5.00/MF$2.25
Franklin McLean Memorial Research Inst., Chicago, Ill.
Optical Versus Radiographic Magnification for Fine-Detail Skeletal Radiography.
H. K. Genant, K. Doi, and J. C. Mall. 1974, 37p

Descriptors: (*Skeleton, Biomedical radiography), (*Biomedical radiography, *Radiation doses), Diagnosis, Images, Patients, Photographic films, Recording systems, Skeletal diseases, Transfer functions.

For abstract, see NSA 32 08, number 19921.

CONF-751001-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Influence of Wr-2721 on Metastatic Tumor Spread after Irradiation.
R. L. Ullrich, M. C. Jernigan, and J. M. Yuhas. 1975, 4p

Descriptors: (*Carcinomas, Metastases), (*Radioprotective substances, *Pharmacology), (*Metastases, *Cell proliferation), Biological radiation effects, Drugs, Mice, Radiotherapy, Survival time.

For abstract, see NSA 32 08, number 19963.

COO-2283-5 PC$4.00/MF$2.25
Michigan State Univ., East Lansing Dept. of Botany and Plant Pathology.
Response of a Forest Ecotone to Ionizing Radiation. Progress Report, 15 October 1974--14 October 1975.
P. G. Murphy. 1975, 5p
Contract E(11-1)-2283

Descriptors: (*Forests, *Biological radiation effects), (*Trees, *Chronic irradiation), Biological wastes, Decomposition, Delayed radiation effects, Gamma sources, Growth, Leaves, Plants, Reproduction, Seedlings, Terrestrial ecosystems, Wisconsin.

For abstract, see NSA 32 08, number 19909.

COO-2283-6 PC$4.50/MF$2.25
Michigan State Univ., East Lansing Dept. of Botany and Plant Pathology.
Response of a Forest Ecotone to Ionizing Radiation. Summary Report, 15 October 1972--14 July 1975.
P. G. Murphy. 1975, 26p
Contract E(11-1)-2283

Descriptors: (*Forests, *Biological radiation effects), (*Trees, *Chronic irradiation), Biological wastes, Decomposition, Delayed radiation effects, Gamma sources, Growth, Leaves, Plants, Reproduction, Seedlings, Terrestrial ecosystems, Wisconsin.

For abstract, see NSA 32 08, number 19910.

COO-2362-7 PC$5.00/MF$2.25
Pennsylvania State Univ., University Park Dept. of Biophysics.
Basic Aspects of Radiation Action on Microorganisms. Progress Report, April 1, 1974--March 31, 1975.
E. C. Pollard. Apr 75, 39p

Descriptors: (*Bacteriophages, *Radiosensitivity), (*Dna, *Biosynthesis), (*Oxygen, *Radiosensitivity effects), (*Antibiotics, Radiosensitivity effects), Biological radiation effects, Biological repair, Decomposition, Dose-response relationships, Hydrogen peroxide, Hydroxy compounds, Ionizing radiations, Mutagenesis, Ultraviolet radiation, Urea.

For abstract, see NSA 32 08, number 19896.

COO-3009-19 PC$4.00/MF$2.25
Hebrew Univ., Jerusalem (Israel). Dept. of Physical Chemistry.
Technical Progress Report, 1 October 1974--1 June 1975.
G. Stein. 1975, 19p
Contract E(11-1)-3009

Descriptors: (*Animal cells, *Biological radiation effects), (*Cytochrome oxidase, *Radiolysis), (*Rna-ase, Radiolysis), (*Dna, *Biosynthesis), Biochemical reaction kinetics, Cell cultures, Enzymes, Molecular biology, Proteins, Radiation injuries, Radiobiology, Research programs.

For abstract, see NSA 3208

COO-3085-42 PC$4.00/MF$2.25
New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
Regulations of Enzymes in Animals: Effects of Developmental Processes, Cancer and Radiation. Progress Report IX, 1 May 1974--31 April 1975.
W. E. Knox. 1975, 15p
Contract E(11-1)-3085

Descriptors: (*Enzymes, *Biochemical reaction kinetics), (*Transferases, *Bioassay), (*Hydrolases, Bioassay), (*Lymphomas, *Biosynthesis), Age dependence, Biological effects, Carcinogenesis, Mammary glands, Neoplasms, Proline, Radioinduction, Rats, Salivary glands, Tissues, Transplants.

For abstract, see NSA 32 08, number 19964.

COO-3085-43 PC$4.75/MF$2.25
New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
Regulations of Enzymes in Animals: Effects of Developmental Processes, Cancer, and Radiation. Comprehensive Three-Year Progress Report, 1 May 1972--30 April 1975.
W. E. Knox. 1975, 31p
Contract E(11-1)-3085

Descriptors: (*Enzymes, *Biochemical reaction kinetics), (*Liver, Carcinogenesis), (*Spleen, Carcinogenesis), (*Carcinogenesis, Biochemical reaction kinetics), Age dependence, Bioassay, Biological effects, Biological radiation effects, Biosynthesis, Growth, Neoplasms, Oxidoreductases, Rats, Tissues, X radiation.

For abstract, see NSA 32 08, number 19965.

COO-3234-25 PC$5.50/MF$2.25
Brown Univ., Providence, R.I.
Physiopathology of Blood Platelets and Development of Platelet Substitutes. Progress Report, August 1, 1974--July 31, 1975.
M. G. Baldini. 1975, 49p
Contract AT(11-1)-3234

Descriptors: (*Blood platelets, *Biological radiation effects), (*Dmso, *Toxicity), Additives, Freezing, In vitro, Irradiation, Nucleotides, Radiation doses, Response modifying factors, Storage, Temperature dependence, Vitamin e, X radiation.

For abstract, see NSA 32 08, number 19888.

COO-3264-11 PC$4.00/MF$2.25
Jackson Lab., Bar Harbor, Maine.
Inborn Anemias in Mice. Progress Report, 1 May 1974--30 April 1975.
E. S. Russell, and S. E. Bernstein. 15 May 75, 20p
Contract E(11-1)-3264

Descriptors: (*Mice, *Congenital diseases), (*Anemias, *Genetic control), (*Hematopoietic system, *Radiosensitivity), Biochemical reaction kinetics, Blood formation, Erythropoiesis, Stem cells.

For abstract, see NSA 3208

COO-3380-17 PC$4.00/MF$2.25
New York Univ., N.Y. Inst. of Environmental Medicine.
Dose and Recovery in Rat Skin Tumor Induction: Data and a Method of Analysis.
R. E. Albert, and F. J. Burns. 1975, 14p CONF-750473-1

Descriptors: (*Skin, *Biological radiation effects), (*Neoplasms, *Radioinduction), (*Electrons, Biological radiation effects), (*Protons, Biological radiation effects), Acute irradiation, Alpha sources, Biological recovery, Carcinogenesis, Dose rates, Dose-response relationships, Energy range, External irradiation, Fractionated irradiation, Mev range 01-10, Mev range 10-100, Radiation doses, Rats.

For abstract, see NSA 32 08, number 19967.

COO-3380-22 PC$4.00/MF$2.25
New York Univ., N.Y. Inst. of Environmental Medicine.
Tumorigenic Action of beta, Proton, alpha, and Electron Radiation on the Rat Skin. Progress Report, August 1, 1974--July 31, 1975.
R. E. Albert, and F. J. Burns. 1975, 16p
Contract AT(11-1)-3380

Descriptors: (*Skin, *Biological radiation effects), (*Alpha sources, *Depth dose distributions), (*Beta sources, Depth dose distributions), (*Electrons, Depth dose distributions), Age dependence, Biological recovery, Carcinogenesis, Dose rates, Germ cells, Neoplasms, Protons, Radiation doses, Radioinduction, Radiosensitivity, Rats, Synergism, Ultraviolet radiation.

For abstract, see NSA 32 08, number 19968.

FRNC-TH-527 PC$11.25/MF$2.25
Toulouse-3 Univ., 31 (France).
Quantitative Study of the Fixation of Radioactive Isotopes in the Organism.
B. Aubert. 1974, 165p
In French. U.S. Sales Only.

Descriptors: (*Radioisotopes, *Tissue distribution), (*Organs, *Scintiscanning), (*Images, *Computer calculations), (*Technetium 99, *Uptake), Geometry, Isomeric nuclei, Radionuclide administration, Radionuclide kinetics, Thyroid.

For abstract, see NSA 32 08, number 20009.

KFK-EXT-23/75-1 PC$4.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Results of Monitoring for Internal Tritium Contamination at the Karlsruhe Nuclear Research Center in 1974.
H. Schieferdecker, L. A. Koenig, and H. Ritz. Jun 75, 10p
In German. U.S. Sales Only.

Descriptors: (*German federal republic, Nuclear facilities), (*Nuclear facilities, *Personnel dosimetry), (*Tritium, Personnel dosimetry), Dose rates, Internal irradiation, Radiation doses, Uptake.

For abstract, see NSA 32 08, number 19995.

LBL-2874 PC$9.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Electron Microscopy at Reduced Levels of Irradiation.
I. A. M. Kuo. May 75, 124p
Contract W-7405-ENG-48

Descriptors: (*Biological materials, *Biological radiation effects), Electron microscopy, Electrons, Images, Low dose irradiation, Quality assurance, Resolution, Sample preparation.

For abstract, see NSA 32 08, number 19889.

SAAS-174 PC$5.00/MF$2.25
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German Democratic Republic).
Report of the State Ministries for Atomic Safety and Radiation Protection of the Gdr.
Dec 74, 40p
In German. U.S. Sales Only.

Descriptors: (*Personnel, *Radiation protection), Leading abstract, Legal aspects, Safety.

For abstract, see NSA 32 08, number 19923.

SAN-899X3 PC$4.00/MF$2.25
Scripps Clinic and Research Foundation, La Jolla, Calif.
Observations on Hemopoietic Marrow. Comprehensive Report, July 1972--June 1975.
Jun 75, 18p
Contract AT(04-3)-899

Descriptors: (*Bone tissues, *Biological radiation effects), (*Bone marrow, Biological radiation effects), (*Blood formation, *Research programs), (*Leukemia, Research programs), Cytochemistry, Cytology, Growth, Hodgkins disease, Lymphomas, Mice, Radiation doses, Spleen, Transplants, Whole-body irradiation.

For abstract, see NSA 32 08, number 19969.

UR-3055-14 PC$10.50/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
Characterization of an Organ-Specific Differentiator Substance.
V. E. Steele. 1975, 150p

Descriptors: (*Planaria, *Biological radiation effects), (*Stem cells, Biological radiation effects), Biological effects, Biological regeneration, Response modifying factors, Tissue extracts, X radiation.

For abstract, see NSA 32 08, number 19992.

UR-3055-15 PC$10.25/MF$2.25
Rochester Univ., N.Y. School of Medicine and Dentistry.
Possible Relationships Between the Early Inflammatory Response and Subsequent Fibrosis in Rat Skin after Irradiation.
R. L. Ullrich. 1975, 143p

Descriptors: (*Skin, *Biological radiation effects), (*Inflammation, *Radioinduction), (*Fibrosis, Radioinduction), (*Blood vessels, *Radiation injuries), Local irradiation, Radiation doses, Rats, Time dependence, X radiation.

For abstract, see NSA 32 08, number 19970.

6S. Stress Physiology

AD-A015 626/5GA PC$3.75/MF$2.25
Naval Medical Research Inst Bethesda Md
The Vestibular Apparatus under Water and in Compressed Gas Environments: Abstracts of Translated Studies.
Medical research progress rept. no. 1,
Robert S. Kennedy. Feb 75, 26p

Descriptors: *Vestibular apparatus, *Hyperbaric conditions, *Stress(Physiology), Underwater, Diving, Decompression sickness, Vertigo, Abstracts, Translations.

Twenty-two studies which contribute to understanding the role of the vestibular system under water and high pressure are abstracted in this report. Several aspects of vestibular function are included (e.g. decompression sickness, pressure vertigo, diver navigation, etc.). The studies were originally published in German (in one case Russion), but have been translated into English. Copies of the full translations are available on request from the author of this report.

AD-A015 627/3GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
A Hyperbaric, Constant-Temperature Growth System Suitable for Cultivation of Microorganisms in Gaseous Environments Pressurized to 1000 psig.
Medical research progress rept. no. 4,
R. Robertson, and V. Frattali. Mar 75, 17p

Descriptors: *Hyperbaric conditions, *Microorganisms, *Stress(Physiology), Helium, Oxygen, Growth(Physiology), Metabolism, Nutrition.
Identifiers: Helium oxygen atmospheres, Rare gases.

A description with general construction specifications is given for a system that allows the cultivation of microorganisms in a hyperbaric environment. Although designed primarily for use with helium-oxygen gas mixtures at a maximum pressure of 1,000 psig, other gas mixtures can be utilized at the maximum or at a lower pressure. The system incorporates water bath temperature control for maintaining the internal environment of a pressure vessel at any selected temperature within the range from -5 to 50C. A number of safety features have been incorporated for protection of the system and the system operator in the event of an inadvertent operpressurization. The system has built-in flexibility to allow use of various types and sizes of microbial culture vessels, and has the capability for being easily modified to accept probes to monitor internal temperature, pH of cultivation medium, concentrations of specific gases, and other factors.

AD-A015 801/4GA PC$6.25/MF$2.25
Payne Inc Annapolis Md
Low-Speed Aerodynamic Forces and Moments Acting on the Human Body.
Final rept. 1 Nov 73-31 Jan 75,
Peter R. Payne. Jul 75, 165p Rept no. Working Paper-119-9 AMRL-TR-75-6
Contract F33615-74-C-4015
See also AD-A005 699.

Descriptors: *Biodynamics, *Aerodynamic forces, Aerodynamic drag, Humans, Bodies, Pitch(Inclination), Yaw, Mathematical models.

Information on the aerodynamic forces acting on the human body is sparse, and scattered in various hard-to-find reports. A primary purpose of this report is to collect the available data in one volume, and to present it in the most useful form. The aerodynamic force and moment data originally reported by Schmitt for three body positions is reported, together with additional data which he did not publish. The drag portion of the Schmitt data is then compared with all other available drag data, represented by wind tunnel tests with volunteer subjects and anthropomorphic dummies, and the instrumented free falls of parachutists and anthropomorphic dummies.

AD-A015 887/3GA PC$3.25/MF$2.25
Army Medical Intelligence and Information Agency Washington D C
Mechanism of Adaptation of the Organism to High-Altitude Hypoxia and the Problem of Prophylaxis,
F. Z. Meyerson. 11 Sep 75, 15p Rept no. MIIA-K-5800
Trans. of mono. Mekhanizm Adaptatsii Organizma k Vysotnoi Gipoksii i Problema Profilaktiki, n.p., p7-15 May/Jun 73.

Descriptors: *Hypoxia, *Stress(Physiology), Adenosine phosphates, Mitochondria, High altitude, Prophylaxis, USSR, Translations, Physiological effects, Adaptation(Physiology), Pathology, Oxygen consumption, Antibiotics.
Identifiers: Oxygen transport mechanisms, Actinomycin.

The report presents the results of a study of the synthesis of DNA, RNA and protein in the nuclei and mitochondria of the heart during the adaptation to intermittent action of hypoxia. The adaptive value of mitochondrial biogenesis in hypoxia consists apparently in the following. The occurring oxygen deficiency lowers the formation of ATP in each mitochondrion. Accordingly, the formation of ATP per unit mass of tissue decreases as well. In response to this, there is activation in mitochondrial biogenesis, and the amount of these organelles per unit mass of tissue increases. Summing up, the functional disturbances which appear primarily as a result of ATP deficiency are abolished inspite of the persistent oxygen insufficiency and the decrease in the formation of ATP by each mitochondrion. Further development of the research concerned with studying the mechanism of adaptation to hypoxia and its prophylactic effects may apparently play its own role in the elaboration of methods of prophylaxis and treatment of heart and brain diseases.

AD-A015 889/9GA PC$3.25/MF$2.25
Army Medical Intelligence and Information Agency Washington D C
Methods for Studying Effects of Environmental Stresses on the Respiratory System of Man,
Pierre Varene, and Henri Viellefond. 6 Oct 75, 10p Rept no. MIIA-K-5925
Trans. of mono. Methodes d'Etude des Effets des Contraintes de L'Environnement sur le Systeme Respiratoire de L'Homme, n.p., p469-472 Jan 73.

Descriptors: *Stress(Physiology), *Respiratory system, Humans, France, Translations, Acceleration tolerance, Environments.

The report presents three stresses imposed by the environment on the thoracic-pulmonary apparatus of man. The stresses are modification of apparent weight, increase in density of ventilated gases and swift variation of ambient pressure. A detailed discussion of each stress and methods involved in determining the effects of the stresses are included.

AD-A015 901/2GA PC$3.75/MF$2.25
Systems Technology Inc Hawthorne Calif
Modeling Biodynamic Effects of Vibration.
Interim scientific rept.,
R. E. Magdaleno, and R. W. Allen. Jul 75, 26p Rept no. STI-TR-1037-2 AFOSR-TR-75-12-1236
Contract F44620-73-C-0075

Descriptors: *Stress(Physiology), *Vibration, *Biodynamics, Humans, Models, Head(Anatomy), Eye, Performance(Human), Pilots, Control systems, Response(Biology), Biomechanics, Motion.

Research during the year included refinement of a General Frequency Model Identification (GERMID) program so as to efficiently fit structural model parameters to data. Structural model refinements including a detailed neuromuscular actuation system model form based on applying the GERMID parameter identification program to some direct neuromuscular system describing function data previously gathered was initiated. Head motion data was reduced, interpreted and compared with head and eye motion data from the literature. Thus during the past two years the investigators have been engaged in determining the basic mechanisms of and models for vibration interference in pilot control tasks. Efforts in the next year will be to simplify some aspects of these component effects models and combine both visual and motor remnant models to give an overall performance model.

AD-A015 914/5GA PC$3.75/MF$2.25
Pennsylvania State Univ University Park Center for Air Environment Studies

Influence of Altered Gaseous Environments on Lung Metabolism.
Annual interim progress rept. 1 Jul 74-30 Jun 75,
Rodney A. Rhoades. Jul 75, 34p AFOSR-TR-75-1272
Grant AF-AFOSR-2767-75
See also AD-784 908.

Descriptors: *Lung, *Oxygen, *Carbon dioxide, *Metabolism, Hypoxia, Hyperoxia, Hypercapnia, Nucleotides, Phospholipids, Fatty acids, Lactates, Pyruvates, Lipids, Stress(Physiology), Gases, In vivo analysis.
Identifiers: Hypocapnia.

The findings from this investigation indicated that 24h in vivo exposure to hyperoxia (100% oxygen) did not alter lung lipid synthesis but did alter lactate production and pyruvate metabolism. In vitro perfusion of lungs for 1.5h showed that direct exposure of lung to altered carbon dioxide tension does not produce edema. Moreover, direct exposure to altered carbon dioxide tension did not alter lipid synthetic capacity. Both lactate and pyruvate metabolism was altered with hypocapnia, while hypercapnia affected only pyruvate metabolism. Twenty four hour hypoxia significantly altered lung cyclic nucleotide levels. These data indicate that altered gaseous environments significantly change certain aspects of lung cellular activity and that changes in lactate and pyruvate metabolites may serve as sensitive indicators to lung dosage.

AD-A015 968/1GA PC$3.75/MF$2.25
Duke Univ Medical Center Durham N C Div of Radiobiology
The Study of Intracellular Metabolic Effects of Hyperbaric Oxygenation on Tissues of Rat and Dog: The Use of Succinate and Other Metabolic Intermediates as Preventatives.
Technical rept.,
Aaron P. Sanders. 20 Aug 75, 40p
Contracts N00014-67-A-0251-0002, N00014-75-C-0188

Descriptors: *Hyperbaric conditions, *Stress(Physiology), *Toxicology, Oxygen, Rats, Dogs, Laboratory animals, Metabolism, Physiological effects, Central nervous system, Lung, Heart, Mammals, Biochemistry, Tissues(Biology), Pharmacology, Succinates, Exposure(Physiology), Metabolites, Experimental data.
Identifiers: *Oxygen toxicity.

Effects of high pressure oxygen (HPO) on CNS and pulmonary system were examined at the subcellular biochemical levels in rat and dog at 1, 1.5, 2, 3, 5, 7, 9, and 11 ATA O2. Biochemical studies were used to show the effects of (HPO) exposures. Comparison of relative efficacy of protective agents (succinate, GABA, glutamate, GSH, cysteine, TRIS, disulfiram LiCl) were compared in the same species and same pressures of HPO. The use of metabolic stimulus to energy production was observed on the CNS and heart.

AD-A016 008/5GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Effect of Hyperbaric Helium on Vitamin Uptake and Utilization by Micro-Organisms.
Medical research progress rept.,
V. Frattali, and R. Robertson. 1975, 6p
Availability: Pub. in Aviation, Space, and Environmental Medicine, v46 n7 p898-901 Jul 75.

Descriptors: *Microorganisms, *Vitamins, *Hyperbaric conditions, Growth(General), Helium, Metabolism, Nutrition, Humans, Hyperbaric medicine, Military medicine, Naval research, Reprints.

Growth responses under hyperbaric helium of various procaryotic micro-organisms to graded levels of six water-soluble vitamins were measured. Vitamins included: thiamin, riboflavin, niacin, pantothenic acid, biotin, and folic acid (folacin). Growth response of each organism under hyperbaric helium was compared with that under 80% He-20% O2 gas mixtures at atmospheric pressure, and with response in air at atmospheric pressure. For five of the six vitamins, no differences in response were observed. Growth response of Streptococcus faecalis to growth-limiting concentrations of folic acid was depressed during cultivation under He-O2 at 69 ATA. It is concluded that growth response of the organism is repressed by hyperbaric helium as a result of interference with uptake or utilization of the vitamin. (Author)

AD-A016 042/4GA PC$3.25/MF$2.25
Naval Medical Research Inst Bethesda Md
Hamster Mortality from Rapid Decompression.
1970, 9p
Pub. in Proceedings of the Intern. Cong. (4th) on Hyperbaric Medicine, p109-115 1970.

Descriptors: *Stress(Physiology), *Decompression sickness, *Hyperbaric medicine, *Diving, Mortality rates, Etiology, Gas embolism, Pathology, Physiology, Laboratory animals, Hamsters, Experimental data.
Identifiers: Pathophysiology.

The incidence of decompression sickness was observed in anesthetized hamsters subjected to rapid decompression from dives on compressed air to depths of 7 to 14.3 atmospheres absolute (ATA). Appearance of bubbles in large arteries and veins was monitored with a dissecting microscope set up to observe the exposed vessels through a chamber window. No systemic symptoms accompanied the appearance of occasional bubbles in the large veins, but respiratory distress always occurred coincident with the appearance of bubbles in large arteries, or a shower of bubbles in large veins. The incidence of fatal decompression sickness as a function of pressure and bottom time was obtained by exposing groups of animals to different dive profiles varying from bottom times of 2 to 30 minutes, and pressures of 7.7 to 14.3 ATA. Analysis of the mortality data by the method of probit analysis indicated the presence of a slow tissue with a half time of 25.5 minutes and a spectrum of tissues with varying half times.

N75-30774/4GA PC$4.75/MF$2.25
California Univ., Berkeley. Research Station.
In Vivo Measurement of Human Body Composition.
Semiannual Status Report, 1 Jul. - 31 Dec. 1974.
N. Pace. 31 Dec 74, 76p NASA-CR-143375, SASR-5
Contract NGR-05-003-470

Descriptors: *Bed rest, *Body measurement (Biology), *Physiological effects, Human factors engineering, Manned space flight, Weightlessness.

For abstract, see STAR 1321

N75-30779/3GA PC$3.25/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
Strain of Human Bodies Protected by Safety Belts in Simulated Frontal Crashes.
D. Kallieris, and G. Schmidt. 1974, 21p CSIR-TRANS-1196
Tran-Transl. Into English from Z. Rechtsmedizin (West Germany), No. 74, 1974 p 31-42.

Descriptors: *Automobile accidents, *Crash injuries, *Human pathology, *Seat belts, Impact loads, Motion simulators, Safety devices, Sleds.
Identifiers: Translations.

For abstract, see STAR 1321

6T. Toxicology

AD-A016 146/3GA PC$3.75/MF$2.25
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Preliminary Assessment of the Acute Toxicity of Malathion in Animals.
Joint study Sep 73-Aug 75,
Maurice H. Weeks, Richard A. Angerhofer, and Charles D. Davenport. Aug 75, 27p Rept no. USAEHA-99-002-74/76

Descriptors: *Toxicology, *Insecticides, Bioassay, Organic phosphorus compounds, Succinates, Exposure(Physiology), Response(Biology), Aerosols, Ingestion(Physiology), Enzymes, Experimental data, Laboratory animals, Dose rate, Dosage, Cholinesterase, Erythrocytes, Rabbits, Birds, Blood plasma.
Identifiers: *Malathion, Phosphorodithioates.

Studies were conducted to acquire information concerning the acute toxicity of malathion in animals under various conditions of exposure. The responses in rabbits and quail exposed to aerosols generated from technical grade malathion (95 percent) and approximating an ultra-low volume ground spray were compared with those from a 6 percent malathion/No. 2 fuel oil mixture simulating a high volume spray. Results indicate that technical grade malathion (95 percent) as an ultra-low volume spray and at effective insecticidal concentrations in particle sizes having a mass median diameter of about 12 micrometers is relatively nonhazardous compared to the possible toxic fuel oil effects of a 6 percent malathion/No. 2 fuel oil mixture with a mass median diameter of 25 micrometers. Based on blood plasma cholinesterase activity analyses, quail were more sensitive to equivalent malathion exposure concentrations than were rabbits. Oral administration of technical grade malathion to rabbits resulted in reduction of plasma and erythrocyte cholinesterase activity in dosages of 120, 300 and 600 mg/kg with death resulting from 1200 mg/kg.

AD-A016 151/3GA PC$3.25/MF$2.25
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Preliminary Hazard Evaluation of Candidate Insect Repellent AI3-36438-Ga, USDA Proprietary Compound.
Final rept. Apr-Jun 75,
LeRoy W. Metker. Jun 75, 11p Rept no. USAEHA-51-108-75/76

Descriptors: *Insect repellents, *Toxicology, Bioassay, Eye, Laboratory animals, Rabbits, Skin(Anatomy), Photochemical reactions, Irritation, Irritants.

A hazard evaluation of the candidate insect repellent USDA Proprietary Compound AI3-36438-Ga, was performed by means of laboratory animal studies using New Zealand White rabbits. Slight corneal opacity, iritis and conjunctivitis were observed after a single application of the technical grade compound to the eyes of rabbits. Moderate primary skin irritation was seen with a single application of the technical grade material to the occluded skin of rabbits. A more severe irritation was observed with the application of the compound to the unoccluded skin of rabbits.

AD-A016 152/1GA PC$3.75/MF$2.25
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Toxicological Evaluation of n-Hexyl Carborane, Carboranylmethylethyl Sulfide and Carboranylmethylpropyl Sulfide.
Special study Jan 74-May 75,

Richard A. Angerhofer, Maurice H. Weeks, and Conrad R. Pope. May 75, 48p Rept no. USAEHA-51-044-74/76

Descriptors: *Toxicology, *Carboranes, *Sulfides, Mutagens, Bioassay, Skin(Anatomy), Lethal dosage, Irritants, Laboratory animals, Ingestion(Physiology), Aerosols, Inhalation, Lung, Eye, Exposure(Physiology), Respiratory system, Industrial hygiene, Experimental data, In vitro analysis, Rocket propellants.
Identifiers: Organic sulfides, Sulfide/carboranylmethyl-ethyl, Sulfide/carboranylmethyl-propyl.

The relative toxicities of technical grade n-hexyl carborane (NHC), carboranylmethylethyl sulfide (CMES) and carboranylmethylpropyl sulfide (CMPS) were investigated using rats, guinea pigs, rabbits and dogs. Each compound produced primary irritation when applied to the intact and abraded skin of rabbits. Data indicated little acute toxic hazard would be expected from acute accidental ingestion. Acute vapor and aerosol inhalation exposures of animals resulted experimentally in no deleterious effect from the three compounds. Respiratory irritation with some minimal lung damage and transient eye effects occurred in dogs and rats as a result of repeated exposures to aerosols of NHC for 6 hours per day, 5 days per week for 6 weeks at concentrations of 77 and 245 mg/cu m. NHC and CMPS appeared to be nonmutagenic on the basis of microbial assays, while CMES appeared to be weakly mutagenic.

PB-245 225/8GA PC$4.25/MF$2.25
Consumer Product Safety Commission, Washington, D.C.
A Report to Congress in Compliance with the Lead Based Paint Poisoning Prevention Act as Amended (PL-93-151),
Richard O. Simpson. 23 Dec 74, 56p

Descriptors: *Lead poisoning, *Toxicology, *Paints, Tables(Data), Consumers, Toxic diseases, Recommendations, Rats, Safety, Monkeys, Laboratory animals, Standards, Legislation, Epidemiology, Chemical analysis, Economic analysis, Research.
Identifiers: *Lead Based Paint Poisoning Prevention Act, Lead based paints.

Congress directed the Chairman of the Consumer Product Safety Commission to conduct appropriate research on multiple layers of dried paint film containing commonly used lead compounds in order to determine a safe level of lead for residential paint products. The document reports the results of those studies and recommends that, based on the research and on the mandate in PL 93-151, a 0.5 percent level of lead in paint is safe for use after December 31, 1974. The research was conducted on baboons and rats by several laboratories. Detailed results of the research are presented in this report. The general conclusion was that there was insufficient scientific evidence to support the reduction of the lead content of paint from 0.5 percent to 0.06 percent. However, an analysis of the research (included in this report) by the Center for Disease Control (DHEW) disagrees with the conclusion that 0.5 percent lead content is safe. The Center suggests that the percent content of lead in paint be reduced.

7. CHEMISTRY

7A. Chemical Engineering

PAT-APPL-588 999/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Recovery of Lead from Battery Scrap.
Patent Application,
Donald A. Wilson. Filed 25 Jun 75, 7p
DOCKET/MIN-2442
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Lead(Metal), *Materials recovery, *Electric batteries, Lead acid batteries, Hydrometallurgy, Lead oxides, Sulfates, Refining.
Identifiers: *Solid waste disposal, *Waste recycling, Lead sulfates.

The patent application describes a technique in which lead is recovered from battery scrap by means of a process comprising (1) reacting the scrap with a slurry of calcium hydroxide to form a product comprising PbO and CaSO4.2H2O, (2) filtering and drying the reaction product and (3) reacting the product with a mixture of carbon and a KCl-NaCl flux at elevated temperature to flux the calcium sulfate and reduce the lead oxide to metallic lead.

PAT-APPL-596 117/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
A Method for Removing Soluble Selenium from Acidic Waste Water.
Patent Application,
Wayne N. Marchant. Filed 15 Jul 75, 7p
DOCKET/MIN-2368
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Selenium inorganic compounds, *Reduction(Chemistry), *Water pollution control, *Industrial waste treatment, Metal powder, Zinc, Industrial water, Scrubbers, Air pollution control equipment, Reducing agents.
Identifiers: Zinc smelting.

A large percentage of zinc is obtained industrially from sulfide ores such as sphalerite, ZnS. Offgases from smelter operations are water-scrubbed. In the scrubbing process SO2 and other soluble materials are absorbed by the scrubber water. When the concentrate contains selenium, the scrub solution will also contain selenium in the form of selenious acid, H2SeO3. The patent application presents a method by which selenium is removed from solution in acidic waste water by treatment of water with a metallic reducing agent, preferably zinc.

PB-245 277/9GA PC$5.25/MF$2.25
Air Products and Chemicals, Inc., Marcus Hook, Pa. Houdry Div.
Engineering and Cost Study of Air Pollution Control for the Petrochemical Industry. Volume 7: Phthalic Anhydride Manufacture From Ortho-Xylene.
Final rept.,
W. A. Schwartz, F. B. Higgins, Jr., J. A. Lee, R. B. Morris, and R. Newirth. Jul 75, 108p EPA/450/3-73-006-g
Contract EPA-68-02-0255
See also PB-244 116.

Descriptors: *Phthalic anhydride, *Air pollution control, *Chemical industry, Manufacturing, Cost estimates, Air pollution control equipment, Inventories, Operating cost, Capitalized costs, Surveys, Industrial wastes.
Identifiers: *Petrochemical industry.

This document is one of a series prepared for the Environmental Protection Agency (EPA) to assist it in determining those petrochemical processes for which standards should be promulgated. A total of nine petrochemicals produced by twelve distinctly different processes has been selected for this type of in-depth study. A combination of expert knowledge and an industry survey was used to select these processes. This volume covers the manufacture of phthalic anhydride from ortho-xylene. Included is a process and industry description, an engineering description of available emission control systems, the cost of these systems, and the financial impact of emission control on the industry. Also presented are suggested air episode procedures and plant inspection procedures.

7B. Inorganic Chemistry

AD-A015 834/5GA PC$4.25/MF$2.25
General Electric Corporate Research and Development Schenectady N Y
Solid-State Properties of Transition Metal Complexes.
Final sscientific rept. 1 Sep 71-30 Jun 75,
L. V. Interrante, and J. S. Kasper. Aug 75, 69p
Rept no. SRD-75-085 AFOSR-TR-75-1418
Contract F44620-71-C-0129

Descriptors: *Metal complexes, *Chelate compounds, Halides, Chemical bonds, Semiconductors, Magnetic properties, Sulfur compounds, Antiferromagnetism.
Identifiers: Metal metal bonds, Heisenberg antiferromagnets.

The report describes the work on solid-state properties of transition metal complexes. Several different types of transition metal complex systems with anisotropic solid-state interactions have been prepared and studied using electrical conductivity, magnetic susceptibility, and spectral measurement methods. The results of these measurements and accompanying x-ray structural studies have been used to derive structure-property relationships and to obtain information regarding the nature of the intermolecular interactions occurring in the solid state.

AD-A016 072/1GA PC$3.25/MF$2.25
Utah State Univ Logan Dept of Chemistry
Photoreactions of Tetrafluorodiphosphine with Nonsubstituted Olefins and Perfluoroolefins,
Joseph G. Morse, and Karen W. Morse. 7 Jan 74, 6p ARO-12335.2-C
Grant DAHC04-74-G-0209
Availability: Pub. in Inorganic Chemistry, v14 n3 p565-569 1975.

Descriptors: *Fluorophosphines, *Photochemical reactions, Infrared spectra, Nuclear magnetic resonance, Spectra, Mass spectra, Reprints.
Identifiers: Olefins, Perfluoroolefins, Tetrafluorodisphosphine.

The photoreactions of P2F4 with C2H4, C3H6, 2-C4H8, C6H10, C2F4, and C3F6 have resulted in the formation of F2PCH2CH2PF2, CH3CHPF2CH2PF2, CH3CHPF2CHPF2CH3, C6H10(PF2)2, F2PCF2CF2PF2, and CF3CFPF2CF2PF2. No recoverable amount of comparable products was obtained in similar mixtures of P2F4 and 2-C4F8 or of P2F4 and C6F10. The new compounds were characterized by ir, nmr, and mass spectrometry. C6H10(PF2)2 displays temperature-dependent nmr spectra consistent with the trans isomer. (Author)

COM-75-50582/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Synthetic Indium Silicate and Indium Hydrogarnet.
Final rept.,
Jun Ito. Oct 68, 11p
Pub. in American Mineralogist, v53 p1663-1673 Sep/Oct 68.

Descriptors: *Indium inorganic compounds, *Crystal growth, Silicates, Calcium inorganic compounds, Beryllium inorganic compounds, Sodium inorganic compounds, Lead inorganic compounds, Strontium inorganic compounds, Hydroxides, Synthesis(Chemistry), Crystal structure, X ray diffraction.

Identifiers: Reprints, Calcium indium silicates, Beryllium indium silicates, Indium silicates, Indium sodium silicates, Indium strontium hydroxides, Indium lead silicates.

The following indium silicates were synthesized hydrothermally and in air: indium grossular, Ca3In2Si3O12; indium aegirine, NaInSi2O6; indium beryl, Be3In2Si6O18; indium thortveitite, In2Si2O7; indium melanotekite, Pb2In2Si2O9; and strontium indium hydrogarnet, Sr3In2(OH)12. Complete solid solubility was found between ferric iron and indium silicates and hydrogarnet end members. Single crystals of indium aegirine up to 2 cm in length were grown in a Na2WO4 flux by slow cooling. The crystal chemical and geochemical behavior of trivalent indium is similar to that of scandium. The ionic radius of trivalent indium of 0.81 A given by Pauling is confirmed.

7C. Organic Chemistry

AD-A016 069/7GA PC$3.25/MF$2.25
Pennsylvania Univ Philadelphia
Nucleation and Growth of Crazes in Amorphous Polychlorotrifluoroethylene in Liquid Nitrogen,
Norman Brown, and S. Fischer. 8 Jan 75, 19p ARO-11782.2-MS
Grants DAHC04-74-G-0121, NSF-DMR-72-03025
Availability: Pub. in Jnl. of Polymer Science: Polymer Physics Edition, v13 p1315-1331 1975.

Descriptors: *Crazing, *Polymers, *Nucleation, Liquid nitrogen, Stresses, Strain rate, Surface properties, Nitrogen, Diffusion, Chlorine compounds, Fluorine compounds, Ethylene, Reprints.
Identifiers: Polychlorotrifluoroethylene.

The density of mature crazes initially increases linearly with stress and then more rapidly at higher stresses. Once the crazes become observable then density was independent of time. The lowest stress at which an appreciably density of crazes was produced corresponds to the proportional limit. The average velocity of mature crazes was constant for a given stress and varied exponentially with the stress. The velocity depended on stress in the same way that the post-yield point stress depended on strain rate, whereas the yield point varied differently being a nonlinear function of the logarithm of the strain rate. The density of crazes was quantitatively related to the concentration of surface defects at which the crazes nucleate. The craze velocity was directly related to the diffusion coefficient of N2 into the polymer. The analysis indicates that bulk diffusion of the N2 governs the craze velocity and that plasticization of the tip of the craze is most important for the nucleation and growth of a craze in PCTFE. (Author)

AD-A016 079/6GA PC$3.25/MF$2.25
University of Southern California Los Angeles
Photophysical Studies on the Benzophenones. Prompt and Delayed Fluorescences and Self-Quenching,
Monte W. Wolf, Ronald E. Brown, Joel H. Parks, Kenneth D. Legg, and Lawrence A. Singer. 27 Jan 75, 9p ARO-10445.10-C
Grant DA-ARO-D-31-124-72-G137
Availability: Pub. in Jnl. of the American Chemical Society, v97 n16 p4490-4497, 6 Aug 75.

Descriptors: *Benzophenones, *Fluorescence, *Quenching(Inhibition), Photochemical reactions, Fluorine compounds, Chlorine compounds, Methyl radicals, Ethers, Ketones, Reprints.

No abstract available.

AD-A016 081/2GA PC$3.25/MF$2.25
Pennsylvania State Univ., University Park. Dept. of Chemistry.
Polymerization and Copolymerization of Phenylhalogenocyclotriphosphazenes,
H. R. Allcock, and G. Y. Moore. 29 Jan 75, 8p ARO-8254.5-C
Grant DA-ARO-D-31-124-72-G205
Availability: Pub. in Macromolecules, v8 n4 p377-382 Jul-Aug 75.

Descriptors: *Phosphazene, *Polymers, *Polymerization, *Copolymerization, Halogen compounds, Chemical derivatives, Copolymers, Reprints.
Identifiers: *Poly(nitrolo-phosphoranylylidene).

N3P3F5Ph (III) homopolymerizes when heated, but gen-N3P3C14Ph2 (IV), gem-N3P3F4Ph2 (V), non-gem-N3P3C13Ph3 (VI), gem-N3P3C12Ph4 (VII), N3P3C1Ph5 (VIII), and (NPPH2)3 (IX) do not. However, compounds III, IV, V, and VI copolymerize with (NPC12)3 (II), whereas VII, VIII, and IX inhibit the polymerization of II. The polymers were derivatized by placement of halogen with CF3CH2O-, or piperidino groups, and the properties of these thermoplastics and elastomers were examined. The mechanistic implications of the results are discussed. (Author)

AD-A016 143/0GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Colorimetric Method of Determination of Amiben in Air, Water and Soil,
L. S. Samosvat, and I. V. Voinova. 7 May 75, 8p Rept no. FTD-ID(RS)I-1310-75
Edited trans. of mono. Trudy Vtorogo Vsesoyuznogo Soveshchaniya po Issledovaniyu Ostatkov Pestitsidov i Profilaktike Zagryaneniya imi Produktov Pitoniya, Kormov i Vneshnei Sredy, Tallin, 1971 p310-312, by Gale M. Weisenbarger.

Descriptors: *Herbicides, Synthesis(Chemistry), Benzoic acids, Halogenated hydrocarbons, Amines, USSR, Translations.
Identifiers: *Amiben, *Benzoic acid/amino-dichloro, Chlorine aromatic compounds.

The herbicide, amiben, 3-amino-2,5-dichlorobenzoic acid, is used in agricultural practice for the pre-germination battle with weeds in vegetable, melon and gourd crops. The report discusses the preparation of chemically pure amiben. It is obtained using the following procedure. Ten ml of concentrated hydrochloric acid is added to 50 ml of ammonium salt compound solution. The resulting precipitate is filtered and washed with diluted hydrochloric acid (1:10), dried and recrystallized twice from methanol with the addition of water or from ether. After drying the compound has a melting point of 200C.

AD-A016 210/7GA PC$3.25/MF$2.25
Wayne State Univ Detroit Mich Dept of Chemistry
Polymer-Based Sensitizers for Photooxidations. II,
A. Paul Schaap, Arthur L. Thayer, Erich C. Blossey, and Douglas C. Neckers. 6 Sep 74, 7p ARO-11030.10-C
Grants DA-ARO-D-31-124-73-G17, NSF-GP-35566
Availability: Pub. in Jnl. of the American Chemical Society, v97 n13 p3741-3745, 25 Jun 75.

Descriptors: *Polymers, *Sensitizing, *Photochemical reactions, Photolysis, Oxygen, Quantum chemistry, Dyes, Reprints.
Identifiers: Sensitizers.

The preparation and use of several polymer-bound sensitizers for singlet oxygen generation are described. Photolysis of oxygen-saturated solutions of singlet oxygen acceptors in the presence of the insoluble sensitizer beads provides a convenient method of photooxidation. The quantum yield for the formation of singlet oxygen with polymer-bound Rose Bengal is 0.43. Several synthetic and mechanistic applications of these heterogeneous sensitizers are described. (Author)

AD-A016 213/1GA PC$3.25/MF$2.25
North Carolina Univ At Chapel Hill Dept of Chemistry
Effects of Weak-Metal Interactions in Ligand-Bridged Complexes of Ruthernium. Dimeric Complexes Containing Ruthenium Ions in Different Coordination Environments,
Robert W. Callahan, Gilbert M. Brown, and Thomas J. Meyer. 7 Aug 74, 12p ARO-11167.9-C
Grants DAHC15-73-G9, DA-ARO-D-31-124-73-G104
Availability: Pub. in Inorganic Chemistry, v14 n7 p1443-1453 1975.

Descriptors: *Ruthenium compounds, *Metal complexes, *Chemical reactions, Ions, Complex ions, Interactions, Pyridines, Reprints.

The preparation and characterization of the salts ((NH3)5Ru(L)RuCl(bipy)2)(PF6)3(L = pyrazine (pyz),4,4-bipyridine (4,4-bipy),trans-1,2-bis(4-pyridyl)ethylene (BPE), and 1,2-bis(4-pyridyl)ethane(BPA)) are described. The 3+ dimeric ions undergo a reversible one-electron oxidation either chemically or electrochemically in acetonitrile giving the mixed-valence (Ru(III)-Ru(II)) ions, ((NH3)5Ru(L)RuC1(bipy)2)(4+). In the mixed-valence ions, the site of oxidation is largely localized on the (NH3)5Ru-group. The twice-oxidized 5+ ions have also been shown to exist in solution using electrochemical methods. For the ions where the bridging ligand has an intact pi system (pyz,4,4-bipy, or BPE), the effects of weak metal-metal interactions are observed in spectral and reduction potential data and in the appearance of intervalence transfer bands for the mixed-valence ions. With BPA as the bridging ligand, the N-heterocyclic pi systems are separated by the saturated CH2 CH2-linkage, and no evidence for metal-metal electronic interactions has been obtained. From the properties of the intervalence transfer band for the mixed-valence pyrazine-bridged dimer, it can be estimated that electronic interactions in the ground state are lower by a factor of 3 than for the Creutz and Taube ion, ((NH3)5Ru(pyz)Ru(NH3)5)() +). (Author)

AD-A016 214/9GA PC$3.25/MF$2.25
North Carolina Univ At Chapel Hill Dept of Chemistry
Chemically Significant Interactions Between Ruthenium Ions in Oxo-Bridged Complexes of Ruthenium(III),
Tom Ray Weaver, Thomas J. Meyer, Ajao Adeyemi, Gilbert M. Brown, and Richard P. Eckberg. 11 Sep 74, 11p ARO-11167.1-C
Grants DA-ARO-D-31-124-73-G104, DAHC15-73-G9
Availability: Pub. in Jnl. of the American Chemical Society, v97 n11 p3039-3048, 28 May 75.

Descriptors: *Ruthenium compounds, *Metal complexes, *Chemical reactions, Oxidation, Ions, Electron transfer, Maghetic properties, Reprints.

A series of oxo-bridged complexes of ruthenium(III), has been prepared. The formulation of the complexes is based on the results of a variety of experiments, including elemental analyses, solution conductivity, and magnetism, and by their electron transfer properties. The chemical and electronic properties of the oxo-bridged dimers are unusual when compared to related bis(2,2-bipyridine) complexes of ruthenium. From electrochemical studies in acetonitrile, the ion ((bipy)2C1RuC1(bipy)2)(2+) can be oxidized to +4 and mixed-valence

+3 (Ru(III)-Ru(IV)) ions and reduced to the mixed-valence (Ru(II)-Ru(III)) +1 ion. The +3 ion has been isolated as the salt ((bipy)2C1RuORuC1(bipy)2)(PF6)3, and the results of an ESCA study indicate that the two ruthenium ions equivalent. The chemical, spectral, and magnetic properties of the oxo-bridged ions can be interpreted by using a qualitative molecular orbital scheme, based on the assumption that strong, chemically significant interactions exist between the ruthenium ions through the bridging oxide ion ligand.

COM-75-50579/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Matrix Isolation Study of the Vibrational Spectrum and Structure of HC2.
Final rept.,
Marilyn E. Jacox. 1975, 9p
Sponsored in part by National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
Pub. in Chemical Physics, v7 p424-432 1975.

Descriptors: *Infrared spectra, Chemical bonds, Decomposition, Acetylene, Interstellar matter.
Identifiers: Reprints, Matrix isolation techniques. *Ethynyl radical.

Detailed isotopic studies of the infrared absorptions characteristic of the products of the decomposition of C2H2 in a mild discharge through argon trapped at 14K indicate that HC2 is an important product and that an absorption at 3612/cml can be assigned to the carbon-hydrogen stretching fundamental of this species. The data suffice for determination of the stretching and stretching-interaction force constants of HC2, which, in turn, have permitted estimates of the bond lengths. The estimated rotational spacing is in excellent agreement with that found for HC2 in recent observations of the interstellar medium.

N75-30269/5GA PC$17.00
Engineering Sciences Data Unit, London (England).
Normal Melting Points, Boiling Points and Critical Points of Branched Chain Esters of Monobasic Alkanoic Acids.
Sep 71, 9p ESDU-71021
Subm-Sponsored by Inst. Of Chem. Engr.

Descriptors: *Critical temperature, *Esters, *Melting points, Chemical composition, Tables (Data), Vapor pressure.

For abstract, see STAR 1321

N75-30272/9GA PC$122.50
Engineering Sciences Data Unit, London (England).
Thermal Conductivity of Liquid Aliphatic Hydrocarbons. 2: Alkenes.
Jun 75, 20p ESDU-75009
Misc-Revised. Subm-Sponsored by Inst. Of Chem. Engr. And Inst. Of Mech. Engr.

Descriptors: *Alkenes, *Dienes, *Liquid phases, *Thermal conductivity, Critical temperature, Melting points, Pressure gradients.

For abstract, see STAR 1321

N75-30273/7GA PC$194.50
Engineering Sciences Data Unit, London (England).
Vapour Pressures and Critical Points of Liquids. 5: Halogenated Methanes.
Jun 75, 31p ESDU-75010
Subm-Sponsored by Inst. Chem. Engr.

Descriptors: *Critical point, *Methane, *Vapor pressure, Graphs (Charts), Halogenation, Pressure gradients, Thermodynamics.

For abstract, see STAR 1321

N75-30873/4GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Microwave Spectra of Some Chlorine and Fluorine Compounds.
W. F. White. Aug 75, 102p NASA-TN-D-8002, L-10208

Descriptors: *Chlorine organic compounds, *Fluorine organic compounds, *Microwave spectra, *Spectroscopic analysis, Chemical composition, Microwave frequencies, Stark effect, Tables (Data).

For abstract, see STAR 1321

N75-30874/2GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Microwave Spectra of Some Volatile Organic Compounds.
W. F. White. Jun 75, 143p NASA-TN-D-7904, L-9995

Descriptors: *Microwave spectra, *Organic compounds, Absorption spectra, Tables (Data).

For abstract, see STAR 1321

PAT-APPL-572 590/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Lasing Dye.
Patent Application,
Peter R. Hammond. Filed 28 Apr 75, 9p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Dyes, *Amines, Synthesis(Chemistry), Patents, Laser materials.
Identifiers: *Patent applications, PAT-CL-260-2, Diamines.

The patent application relates to the use of dyes in lasers and to the preparation of such dyes. More particularly, it relates to the use of dyes to lase in the violet to blue-green portion of the spectrum and to the preparation of such dyes. Methods for preparing R2N-(phenyl(sub n))-NR2 wherein n is 3 or 4 and R is H, CH3 or C2H5 are discussed.

PAT-APPL-580 444/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Regular Copolyamides as Desalination Membranes.
Patent Application,
Otto F. Vogl, and Donald R. Stevenson. Filed 23 May 75, 15p DOCKET/SAL-2148
Also includes report no. DOCKET/SAL-2453.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Polyamide resins, *Membranes, Synthesis(Chemistry), Polymerization, Amines, Osmosis, Desalting, Diames, Esters.
Identifiers: *Reverse osmosis, Reverse osmosis desalination.

The patent application concerns the synthesis of regular copolyamides of the formula -(HN-(CH2)x-NH-C(=O)-(CH2)y-C(=O)-NH-(CH2)x-NH-C(=O)-R-C(=O)) where x is 2 to 10, y is 0 to 8, R is a divalent aliphatic or aromatic radical having 1 to 34 carbon atoms, and n is not less than 10. These are prepared by reacting an aliphatic diester with an excess of an aliphatic diamine to form a diamine diamide, and reacting the diamine diamide intermediate with an aliphatic or aromatic diacid chloride. Permselective membranes prepared from the copolyamides find particular utility in desalination of water by reverse osmosis.

PAT-APPL-589 489/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Efficient Dye Laser Materials for the Ultraviolet.
Patent Application,
Peter R. Hammond. Filed 20 Jun 75, 8p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Laser materials, *Dyes, *Pyridines, Patents, Dye lasers, Ultraviolet radiation, Synthesis(Chemistry), Copper compounds, Sulfates.
Identifiers: *Patent applications, Ultraviolet lasers, Pyridine/bis(dimethyl amino), Pyridine/bis(methylamino), Pyridine/dichloro, Copper Sulfates, PAT-CL-331-95.

The patent application discloses methods for preparing 2,6-bis(methylamino)pyridine and 2,6-bis(methylamino)pyridine. The methods involve the reaction of 2,6-dichloropyridine with an aqueous solution of either dimethylamine or methylamine, in the presence of copper sulfate for fifteen hours in a bomb at 160C. The compounds synthesized are useful as lasing dyes.

PATENT-3 899 517 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Perfluoro Alkylene Dioxy-Bis-(4-Phthalic Anhydrides and Oxy-Bis-(Perfluoroalkyleneoxyphathalic Anhydrides.
Patent.
J. A. Webster. Patented 12 Aug 75, 7p PAT-APPL-489 008
Misc-Filed 16 Jul. 1974 Supersedes N74-29479 (12 - 19, p 2246). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Anhydrides, *Perfluoro compounds, Aromatic compounds, Carboxylic acids, Chemical reactions, Imides, *Patents, Sealers.
Identifiers: PAT-CL-260-346.

Dianhydrides were found which when reacted with diamines provide polyimides exhibiting excellent thermal, oxidative, and hydrolytic stability and good tensile strength and elongation. There characteristics make the polyimides useful as sealants in advanced aerospace structures.

PB-245 089/8GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
Simulation and Optimization of Continuous Penicillin Amidase Reactor System Utilizing Immobilized Enzymes.
Final technical letter rept. 1 Nov 72-15 Jul 73,
Dewey D. Y. Ryu. 15 Jul 73, 39p NSF/RA/T-73-024
Grant NSF-GI-36405

Descriptors: *Enzymes, Drugs, Chemical reactors, Mathematical models, Performance evaluation, Amines, Reaction kinetics, Performance evaluation.
Identifiers: *Amidase/penicillin, *Immobilized enzymes, *Enzyme technology, *Thia-1-azabicyclo(3.2.0.)heptane carboxylic acid/aminodimethyl-oxo, *Penicillanic acids.

The main objective of the proposed research has been to experimentally verify the usefulness of a mathematical model of the reaction of immobilized pencillin amidase enzyme that we have developed and to devise an economical

process for the production of 6-aminopenicillanic acid (6-APA) from benzylpenicillin. Kinetic constants of the enzyme reaction that are important in the study of performance of the enzyme reactor system have been ascertained through experimental studies of the enzyme reaction. The mathematical model developed was found to be satisfactory for the simulation and optimization studies of the enzyme reactor performance. The model used is based on the reaction kinetics that takes into consideration combined inhibitory effects of the reaction products, namely, 6-APA non-competitively and phenylacetic acid (PAA) competitively. It was also found from experimental studies that the penicillin amidase prepared from Bacillus Megatebium strain did not show the substrate inhibition effect. The results of computer simulation of the performance of enzyme reactor system that is based on the mathematical model showed a very good agreement with the experimental results.

PB-245 092/2GA PC$5.75/MF$2.25
Iowa State Univ., Ames. Dept. of Chemical Engineering.
Factors Affecting the Activity and Stability of Glucose Isomerase Immobilized on Porous Glass.
Master's thesis,
Alfred Richard Fratzke, Jr. 1974, 127p
NSF/RA/T-74/099
Grant NSF-GI-34933

Descriptors: *Enzymes, *Starches, Supports, Chemical reactors, Beds(Process engineering), Cobalt, Magnesium, Additives, Theses, Glucose, Sugars.
Identifiers: *Immobilized enzymes, *Isomerase/glucose, Enzyme activity, Enzyme supports, Enzyme stability.

The purpose of this investigation has been to determine accurately the catalytic activity and the thermal stability of glucose isomerase from Streptomyces sp. as a function of reactor temperature and chemical composition. The reason is for the conversion of cornstarch to glucose. Glucose isomerase was immobilized on zirconium oxide-coated porous glass beads via glutaraldehyde coupling and was tested for relative activity and stability in a continuous, single-pass, differential, packed bed reactor system. The immobilized enzyme displayed activity responses quite similar to those previously reported for free and immobilized glucose isomerases, with an energy of activation of 17 kcal. Mg ions produced optimal activity at pH 7.0 and 55C. Addition of Co ions produced little further enzyme activation. Co ions alone were one-third as effective as Mg. Addition of Co ions to Mg ions enhanced stability ten-fold at pH 7.0, while addition of Mg to Co did not increase stability.

PB-245 096/3GA PC$7.25/MF$2.25
Massachusetts Univ., Amherst.
Studies of Peroxide Deactivation and Glucose Removal with Immobilized Glucose Oxidase and Catalase.
Master's thesis,
Robert E. Altomare. Jun 74, 222p NSF/RA/T-74-098

Descriptors: *Enzymes, *Eggs, *Sugar, *Catalases, Glucose, Chemical reactors, Beds(Process engineering), Reaction kinetics, Theses, Hydrogen peroxide, Food processing.
Identifiers: *Enzyme technology, *Oxidase/glucose, Continuous flow, *Immobilized enzymes, Desugaring, Enzyme deactivation.

A series of studies using immobilized glucose oxidase and catalase in a continuous flow, tubular, packed bed reactor have been performed. The studies were aimed at developing an immobilized enzyme system for the desugaring of eggs. Quantitative expression for the deactivation of both beef liver and fungal Aspergillus niger catalases by hydrogen peroxide decomposition and enzyme deactivation rate constants have been shown to satisfactorily describe catalase deactivation for substrate peroxide concentrations in the range of 0.1 to 0.001 molar. Other observations indicate that the catalases are more stable toward peroxide attack when the reactors are operated with longer residence times. Immobilized fungal and beef liver catalases are also shown to possess comparable activity for peroxide decomposition. Manganese dioxide on alumina was investigated as a peroxide decomposition catalyst and showed itself to be much more stable toward peroxide attack than the immobilized catalases though significantly less active. The use of mixed beds of glucose oxidase immobilized on Kieselguhr and manganese catalyst were not wholly successful in desugaring 'simulated' egg solutions. Egg white desugaring was hindered by plugging and gel formation until the mucin protein fraction was precipitated and removed. This solution is considered unsatisfactory by the egg industry.

PB-245 128/4GA PC$3.75/MF$2.25
California Univ., San Diego, La Jolla.
Proceedings of Conference on Enzyme Engineering as Related to Food and Energy Production, Held at the University of California, San Diego, on 22-25 July, 1974,
William D. McElroy. 1974, 27p NSF/RA/T-74-012

Descriptors: *Enzymes, *Energy sources, *Food, Meetings, Manufactured gas, Methane, Photosynthesis, Water, Hydrogen, Biochemical fuel cells, Cellulose, Decomposition, Agricultural wastes, Nitrogen fixation.
Identifiers: *Enzyme technology, *Immobilized enzymes.

The reports presents the conference's recommendations and summary background information for further research on enzyme engineering as related to food and energy production. Primary emphasis is in generation of methane, biophotolysis of water, efficient utilization of cellulose, biochemical fuel cells, nitrogen fixation, and the purification and stabilization of enzymes and enzyme systems.

7D. Physical Chemistry

AD-A015 629/9GA PC$4.75/MF$2.25
Naval Weapons Support Center Crane Ind
A Mathematical Model of Flare Plume Combustion and Radiation.
Final rept. 1 Jul 72-30 Jun 74,
John E. Tanner, Jr. 30 Jun 75, 84p Rept no. NWSC/CR/RDTR-9

Descriptors: *Pyrotechnics, *Flares, *Combustion, *Emissivity, Luminosity, Mathematical models, Electromagnetic radiation, Flames, Thermodynamics, Plumes, Smoke, Computer programs.

A mathematical model of combustion and radiation in the plume of a pyrotechnic flare was constructed based on observations and on relevant radiation and thermodynamic theory. The model is applied to specific cases by means of computer program which computes the equilibrium thermodynamic properties and the radiation rates at closely spaced points from the flare surface, where combustion begins, to the tail of the plume where radiation is essentially zero. The calculations indicate that in real flares a significant amount of air augments combustion and that this air has a large effect on flame temperature and on luminous output. The smoke is found to emit as a weak graybody. Burning times for the magnesium particles are indicated. When appropriate theoretical and experimental input data are supplied, the program should be useful for predicting output from new formulas giving radiation in a large number of wavelengths or wavelength bands. Specifically, the model should be useful for formulating colored flares and infrared flares. The computer program used is described.

AD-A015 633/1GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Adatom Dipole Moments on Metals and Their Interactions.
Technical rept.,
Walter Kohn, and King-Hon Lau. Sep 75, 15p
Rept no. TR-33
Contract N00014-69-A-0200-6026

Descriptors: *Surfaces, *Adsorption, *Dipole moments, Metals.
Identifiers: Adatoms.

An expression is derived for the dipole moment mu, associated with an arbitrary adatom on an arbitrary metal surface, in terms of the differential work done in moving the adatom from the interior of the metal to its actual position in the presence and absence, respectively, of a small, asymptotically uniform electric field on the exterior of the metal. With the aid of this expression it is shown for a jellium metal what the non-oscillatory part of the interaction energy of two dipoles mu(A) and mu(B), situated on the surface and separated by a large distance v, is. This value exceeds by a factor of 2 from the interaction energy of two dipoles in the same relative configuration but in a vacuum. The reason for the difference is that the screening charge of an adatom is delocalized on the metal surface.

AD-A015 634/9GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
A Theoretical Model for Induced Charging Currents in Potentiostatic Chronoamperometry. Applications to Photoelectrochemistry.
Technical rept.,
S. S. Fratoni, Jr., and S. P. Perone. Sep 75, 39p
Rept no. TR-5
Contract N00014-75-C-0874

Descriptors: *Electrochemistry, *Photochemical reactions, *Electrolysis, Electric current, Mathematical models, Electric double layer, Diffusion.
Identifiers: *Chronoamperometry, *Amperometry, *Flash photolysis.

It has been assumed previously that charging current is only significant for electrochemical experiments where the applied potential is varied (e.g., potential step, potential sweep). This paper deals with characterization of charging current contributions to chronoamperometric measurements under potentiostatic conditions, where the charging current is induced by the changing faradaic current. This case corresponds directly to the conditions for chronoamperometric measurements of flash photolytic processes, commonly called photopolarography. A theoretical model applicable to any electrolysis mechanism, and a general method of analysis, are presented to characterize this charging current. In addition, the model is extended to include potential-step chronoamperometry. Application of this model to these two specific cases demonstrates the significance of the charging current term relative to measured current.

AD-A015 641/4GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
Extraction of Faradaic Signals from Flash Photocurrent Measurements--Benzophenone Photolysis.
Technical rept.,
K. F. Dahnke, S. S. Fratoni, Jr., and S. P. Perone. Sep 75, 42p Rept no. TR-6

Contract N00014-75-C-0874

Descriptors: *Electrochemistry, *Photochemical reactions, Electric current, Benzophenones, Solutions(Mixtures).
Identifiers: *Chronoamperometry, *Amperometry, Photoelectrochemistry, *Flash photolysis.

The first paper in this series developed a theoretical model for characterizing the charging currents induced by changing faradaic currents measured under potentiostatic conditions. Of specific concern here are photoelectrochemical measurements, although the principles are generally applicable to chronoamperometry. This paper is concerned with experimental verification of the predicted relationships and demonstration of the direct applicability of the model to the correction of experimental data for more accurate determination of faradaic currents. Corrected and uncorrected data are given for the potentiostatic and potential-step cases, both in the form of current-time profiles and Cottrell plots. Effects of variation of the cell time constant are presented to further demonstrate the magnitude of the charging effect and consistency of the model. The flash photolysis instrumentation, including computerization, used to obtain the experimental data for this work is also described.

AD-A015 642/2GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
Theory for Induced Charging Currents in Potentiostatic Chronoamperometry Involving Coupled Chemical Reactions. Applications to Photoelectrochemistry.
Technical rept.,
S. S. Fratoni, Jr., and S. P. Perone. Sep 75, 26p
Rept no. TR-7
Contract N00014-75-C-0874

Descriptors: *Electrochemistry, *Photochemical reactions, *Electrolysis, Electric double layer, Diffusion, Solutions(Mixtures), Mathematical models, Electric current, Reaction kinetics.
Identifiers: *Chronoamperometry, *Amperometry, Photoelectrochemistry, *Flash photolysis.

Previously a theoretical model was developed for characterizing the charging currents induced by changing faradaic currents measured under potentiostatic conditions. This paper describes application of the theoretical model to measurements involving electrolysis mechanisms complicated by competing reactions. The model is particularly relevant for flash photoelectrochemical studies. The mechanisms considered here include 1st-order and 2nd-order decay of electroactive photoproducts. The dependence of measured currents on various experimental and chemical parameters--including the cell time-constant, photoproduct concentrations, and rate constants--is described for a wide range of conditions. Theoretical relationships can be used to predict total measured currents, or to tabulate correction factors to extract purely faradaic currents from measured currents. In addition, an alternative derivative-correction method for extracting faradaic signals from combined currents is described.

AD-A015 705/7GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Mechanical Engineering and Astronautical Sciences
Nucleation Experiments in Molecular Beams.
Technical rept.,
James A. Armstrong, and Gilbert D. Stein. Sep 75, 10p Rept no. TR-1
Contract N00014-67-A-0356-0027

Descriptors: *Nucleation, *Molecular beams, Water vapor, Carbon dioxide, Electron diffraction, Diffraction analysis, Electron scattering.
Identifiers: Expansion flow, Cluster(Atoms).

A nozzle molecular beam is used as a cluster generator, and the beam are examined with an ionization gage detector and high energy electron diffraction. The diffraction patterns of carbon dioxide and water for conditions of maximum clustering have 'averaged' cluster sizes of 1400 and 3400 molecules/cluster, and crystalline structure of simple cubic and diamond cubic which is characteristic of their respective bulk phases.

AD-A015 706/5GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Mechanical Engineering and Astronautical Sciences
Electron Diffraction Studies of Clustered Nozzle Beams.
Technical rept.,
Philip R. Jeuck, Gerald Saxon, and Gilbert D. Stein. Sep 75, 12p
Contract N00014-67-A-0356-0027

Descriptors: *Nucleation, *Molecular beams, *Phase transformations, Electron diffraction, Electron scattering, Diffraction analysis.
Identifiers: Expansion flow, Cluster(Atoms).

The goal of the work outlined here is to determine the structure of atomic and molecular clusters small engough to constitute the starting or critical size for phase transitions from the vapor state (i.e. 10-100 molecules/cluster). The clusters are nucleated homogeneously from the vapor phase in the free jet expansion of a molecular beam apparatus. Their size and structure are obtained through use of high energy electron diffraction. Additional stages of differential pumping have been added in order to get the molecular beam-electron scattering chamber down to the 10 to the -8 power to 10 to the -9 power toor range. Diffraction patterns will be taken by sweeping them over a slit-phosphor scintillator-photomultiplier arrangement using magnetic coils. Conservative estimates on the minimum cluster sizes attainable using the lower pressure scattering chamber and phase sensitive detection are presented.

AD-A015 710/7GA PC$3.25/MF$2.25
Georgia Inst of Tech Atlanta School of Physics
Reflectance Spectroscopy and Auger Spectroscopy of Metals and Alloys.
Interim scientific rept. 1 Oct 74-1 Jul 75,
James R. Stevenson. 15 Aug 75, 11p AFOSR-TR-75-1380
Grant AF-AFOSR-2773-75

Descriptors: *Auger electron spectroscopy, *Surface properties, Scientific research, Metals, Oxides.
Identifiers: *Reflectance spectroscopy.

Optical reflectance studies have been demonstrated to be a valuable tool in probing the mechanisms of corrosion, passivity, and protective coatings on metals and alloys. Although Auger spectroscopy is necessary to characterize the surface, the use of different wavelength intervals to obtain different optical penetration depths is an important consideration in understanding mechanisms taking place in transition layers between the surface and the bulk. Further measurements on the infrared characteristics of synchrotron radiation have shown that the synchrotron provides a valuable source for surface studies in the infrared. The report briefly describes the author's work in this area.

AD-A015 713/1GA PC$3.75/MF$2.25
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
Compilation of Abstracts - 1975 AFOSR Contractors Meeting on Combustion Kinetics.
Interim rept.
Sep 75, 38p AFOSR-TR-75-1448
Grant AF-AFOSR-2604-74

Descriptors: *Meetings, *Combustion, *Plumes, Reaction kinetics, Relaxation time, Abstracts, Hydrocarbons, Oxidation, Infrared radiation, Flames.
Identifiers: Rocket plumes, Molecular relaxation.

The report is a collection of the abstracts of talks given by contractors and grantees of the Air Force Office of Scientific Research (AFOSR) in the area of chemical kinetics related to combustion, plume and wake technologies at a meeting held at the Air Force Armament Laboratory, Eglin AFB, Florida, 4-5 September 1975.

AD-A015 718/0GA PC$3.75/MF$2.25
Washington Univ Seattle Lab for Chemometrics
Measurement Analysis by Pattern Recognition.
Technical rept. no. 8, Aug 74-Aug 75,
Bruce R. Kowalski. Aug 75, 31p
Contract N00014-75-C-0536

Descriptors: *Pattern recognition, *Chemical analysis, Chemistry, Matrices(Mathematics).

This report describes the current state of the art and future projections for the development and application of pattern recognition in chemistry. Emphasis is on the analysis of analytical chemistry measurements, but discussion of other chemical applications are also included.

AD-A015 752/9GA PC$5.25/MF$2.25
Air Force Office of Scientific Research Bolling AFB D C
Annual AFOSR Chemistry Program Review (20th).
Special scientific rept. for the fiscal year 1974,
Denton W. Elliott. Jan 75, 127p Rept no. AFOSR-TR-75-0828
See also report dated Jan 74, AD-A005 688.

Descriptors: *Chemistry, *Air Force research, Chemical analysis, Surface chemistry, Thermal stability, Reaction kinetics, Scientific research, Molecular spectroscopy, Electrochemistry, Lasers, Polymers.

This review provides a record of research in progress, along with illustrative achievements resulting from the basic research program of the Directorate of Chemical Sciences, Air Force Office of Scientific Research (AFSC). The first section of the three principal sections presents various technical aspects. It contains articles on Chemical Instrumentation and Techniques, Surface Chemistry, Chemical Approaches to New Thermally Stable Materials, and Research in Gas Phase Kinetics. The second section contains program statistics. The third section consists of research efforts completed in Fiscal Year 1974.

AD-A015 780/0GA PC$3.25/MF$2.25
Utah Univ Salt Lake City Dept of Physics
Exact-Exchange Crystal Hartree-Fock Calculations of Molecular and Metallic Hydrogen and Their Transitions.
David E. Ramaker, Lalit Kumar, and Frank E. Harris. 17 Sep 74, 4p AFOSR-TR-75-1389
Grants AF-AFOSR-1992-71, NSF-CP-31373
Availability: Pub. in Physical Review Letters, v34 n13 p812-814, 31 Mar 75.

Descriptors: *Hydrogen, Hartree-Fock approximation, Feasibility studies, Transitions, Solid phases, High pressure, Molecular orbitals, Phase transformations, Metals, Equations of state, Exchange reactions, Crystal lattices, Density, Operators(Mathematics), Brillouin zones, Band theory of solids, Atomic properties, Molecular properties, Reprints.

Hartree-Fock calculations using the exact-exchange operator are reported for molecular and metallic solid hydrogen. Both calculations used the same basis set and the same crystal formalism. The calculations indicate a transition to the metallic phase at a pressure of 2.1 Mbar, in agreement with recent experiments. (Author)

AD-A015 833/7GA PC$4.25/MF$2.25
General Electric Corporate Research and Development Schenectady N Y
Quantum Theoretical Studies of Gas-Solid Interactions.
Final rept. 1 Sep 71-30 Jun 75,
R. P. Messmer, and C. W. Tucker. Aug 75, 63p
Rept no. SRD-75-086 AFOSR-TR-75-1419
Contract F44620-72-C-0008

Descriptors: *Surfaces, *Chemisorption, *Molecular orbitals, Crystal structure, Atoms, Mathematical models, Chemical bonds, Semiconductors, Metals, Wave functions, Catalysts.
Identifiers: *Gas surface interactions, Self consistant field molecular orbitals.

In this final report, the authors summarize the results of their theoretical investigations into gas-solid interactions. In order to provide a proper perspective, they succinctly compare their approach to the more traditional solid state approaches to this problem. As previous reports have described our earlier work in some detail, they briefly review this prior work here. The main emphasis of this report is on theoretical gas-solid studies completed during the past year, which is previously unpublished.

AD-A015 844/4GA PC$3.25/MF$2.25
Missouri Univ Columbia Dept of Chemistry
Studies of Energy and Momentum Exchange between Solids and Gases.
Final rept. 1 Jul 72-30 Jun 75,
Lloyd B. Thomas. 30 Jun 75, 13p AFOSR-TR-75-1439
Grant AF-AFOSR-2440-73

Descriptors: *Surfaces, *Gases, Kinetic theory, Heat transfer, Scientific research.

This report briefly describes the results of three years research under the given title. Topics briefly described are: Experimental basis for test and development of the kinetic theory of heat conduction by gases; measurement of tangential momentum accommodation on controlled surfaces; temperature distribution and heat flow from filaments; and the McLeod gauge mercury pumping error. The publications made as a result of the work are listed.

AD-A015 852/7GA PC$3.25/MF$2.25
Instituto Nacional de Tecnica Aeroespacial Madrid (Spain)
Steady State Behavior of Hydrazine Catalytic Thrusters.
Interim rept. no. 3, 1 Jan-31 Dec 74,
A. Crespo, E. Fraga, and A. Munoz. 16 Jul 75, 24p AFOSR-TR-75-1238
Grant AF-AFOSR-2253-72
See also report dated 27 Jun 74, AD/A000 542.

Descriptors: *Hydrazine, *Catalysis, *Decomposition, *Monopropellants, Reaction kinetics, Ammonia, Temperature, Spain.

A theoretical analysis is described by means of which temperatures and concentrations are calculated along a chamber where hydrazine decomposes catalytically. The corresponding results have to be calculated numerically. A single nondimensional parameter seems to be the only one needed to describe the main characteristics of the problem. Of particular interest is the results that the maximum temperature is reached at a certain distance that expressed in non-dimensional variables seems to vary little in a wide range of operating conditions, this allows to find a close expression for the value of this distance. Comparisons have been carried out with the results of some experiments made at INTA.

AD-A015 854/3GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
Fast Kinetic Methods Applicable to Trace Chemical Analysis and Detection.
Final rept. 1 Nov 70-30 Apr 75,
Dale W. Margerum, and Harry L. Pardue. Aug 75, 12p AFOSR-TR-75-1363
Grant AF-AFOSR-1988-71

Descriptors: *Chemical analysis, Scientific research, Microanalysis.

Briefly described is research concerning the improved detection of chemical species in stopped-flow spectroscopy and the application of kinetic methods to chemical analyses. The research has included: Development of rapid scanning spectrometers using vidricon tubes; development of computer-controlled stopped-flow studies; kinetic methods of analysis; kinetics of oxidation of aminopolycarboxylate complexes of bivalent metal ions by halogens; and detection of chloramines and the chemistry of chloramines.

AD-A015 856/8GA PC$5.25/MF$2.25
National Bureau of Standards Washington D C
Potential Energy Surfaces for Air Triatomics. Volume II. Results of SCF and Preliminary OVC Calculations.
Interim rept. Jul-Dec 74,
P. J. Fortune, D. G. Hopper, B. J. Rosenberg, W. B. England, and G. Das. Jun 75, 115p ARL-75-0202-Vol-2
Contract F33615-72-M-5016

Descriptors: *Molecular orbitals, *Quantum chemistry, Wave functions, Water, Nitrogen oxides, Ozone, Carbon dioxide, Molecular energy levels, Ions, Chemical bonds, Potential energy.
Identifiers: *Self consistant field molecular orbitals, Nitrogen dioxide, Nitrogen oxide(N2O).

Computations at the SCF and MCSCF levels have been made on the vertical excitation energies and some of the ground and excited state potential surfaces of the fifteen air triatomic molecules: water, nitrogen dioxide, ozone, carbon dioxide, nitrous oxide, and their positive and negative ions. The results presented are preliminary for the most part. Their accuracy will be assessed in a later report in which correlation effects will be more extensively examined than that have been in the present report.

AD-A015 902/0GA PC$4.25/MF$2.25
Stanford Research Inst Menlo Park Calif
Studies of Homogeneous and Heterogeneous Hydrazine Decomposition for Monopropellant Propulsion Systems.
Annual rept. 1 Jun 74-31 May 75,
S. W. Benson, J. L. Falconer, D. M. Golden, S. E. Stein, and H. Wise. 25 Jul 75, 72p AFOSR-TR-75-1373
Contract F44620-73-C-0069

Descriptors: *Hydrazine, *Monopropellants, *Catalysts, *Surface chemistry, Decomposition, Auger electron spectroscopy, Iridium, Reaction kinetics, Deactivation, Ignition, Catalysis, Desorption, Surface properties.
Identifiers: *Shell 405 catalyst.

The overall objective of this study is the elucidation of the gradual activity decay exhibited by hydrazine fuel thrusters operating in a pulse mode and using granular-supported iridium catalysts (Shell-405). The report describes surface studies on Shell-405 catalyst by temperature-programmed desorption, surface-area titration, and Auger electron spectroscopy which point to a loss in active surface area of iridium caused by crystallite sintering and accumulation of surface impurities following exposure to hydrazine. The heterogeneous decompositon kinetics point to a reaction order of 1/2 on silica surfaces and of unity on Shell-405 catalyst. The products of decomposition are temperature dependent. These results provide some insight into the causes of catalyst deactivation resulting from surface changes of the active metal component of Shell-405 catalyst, i.e., the iridium crystallites.

AD-A015 924/4GA PC$3.25/MF$2.25
Stanford Research Inst Menlo Park Calif
Sensitivity Fundamentals.
Semiannual technical progress rept. 1 Jan-30 Jun 75,
D. S. Ross, N. A. Kirshen, and T. Mill. Aug 75, 20p Rept no. SRI-TPR-75-1
Contract N00014-70-C-0190
See also report dated Feb 75, AD-A009 816.

Descriptors: *Nitrogen oxides, *Decomposition, *Detonations, Reaction kinetics, Oxidation, Shock, Organic nitrogen compounds.
Identifiers: *Nitro compounds, Nitrogen oxides(NO), Nitrogen oxide(N2O4), Nitrogen dioxide, Chemical reaction mechanisms.

The suggestion that a pressure-sensitive equilibrium is important to the initiation of detonation in nitroalkanes has been tested. First, considered was the potentially important step NO + NO2 = N2O3 to O2 + N2O and the thermal decomposition of N2O3 at 130C and about 35 atm. When a small amount of water was added to the system, a violent explosion occurred after about 5 minutes of heating. The reaction between NO and NO2 may be water catalyzed and may offer some insight into the energetics of nitroalkane detonation. Also studied was the oxidizing abilities of NO2/N2O4 systems at 100C and 10-20 atm., using isobutane as the organic substrate. The rate of reaction was determined. The results are consistent with our proposition that under detonation initiation (high pressure-high temperature) conditions N2O4 is the p predominant species and is in some way responsible for the oxidation.

AD-A016 004/4GA PC$3.25/MF$2.25
Cornell Univ Ithaca N Y Dept of Chemistry
The Structure and Formation of Stable C2H4O Ions,
C. C. Van de Sande, and F. W. McLafferty. 10 Sep 74, 5p ARO-8246.18-C
Grant DA-ARO-D-31-124-72-G180
Availability: Pub. in Jnl. of the American Chemical Society, v97 n16 p4613-4616, 6 Aug 75.

Descriptors: *Isomers, Ions, Ionization, Cations, Molecular isomerism, Molecular structure, Spectra, Stability, Reprints.

No abstract available.

AD-A016 011/9GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Quenching of Vibrationally Excited Nitric Oxide by Molecular Oxygen and Nitrogen,
R. E. Murphy, E. T. P. Lee, and A. M. Hart. 27 Feb 75, 80p Rept no. AFCRL-TR-75-0538
Availability: Pub. in Jnl. of Chemical Physics, v63 n7 p2919-2925, 1 Oct 75.

Descriptors: *Quenching, Nitrogen oxides, Oxygen, Nitrogen, Electrons, Excitation, Mixtures, Molecular vibration, Reprints.

No abstract available.

AD-A016 053/1GA PC$3.75/MF$2.25
Tel-Aviv Univ (Israel)

Electronic Energy Transfer in Gas Mixtures.
Final scientific rept. 1 Jul 74-30 Jun 75,
R. Shuker, Y. Binur, and A. Szoke. 30 Jun 75, 26p AFOSR-TR-75-1368
Grant AF-AFOSR-2518-73

Descriptors: *Plasma medium, *Gas ionization, Energy transfer, Electric discharges, Carbon monoxide, Helium, Excitation, Cross sections, Computer programs, Israel.
Identifiers: Penning ionization.

Time resolved spectroscopy of He/CO discharges shows that helium transfers electronic excitation energy via Penning ionization and charge exchange yielding CO(+)(B). Dissociation of CO is unimportant. A computer simulation of the current pulse is described and used for pure helium discharge. The program is listed. The results show the time dependence of the current and the electron density and temperature. The model used is simplified to include only two plasma processes, i.e. ionization and recombination. It incorporates velocity averaged ionization cross-section. Work on afterflow in Ar/CO and Ar/Kr systems is also mentioned.

AD-A016 062/2GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Lab Operations
Vibrational Relaxation of DF by He and Ar,
Jerry F. Bott. 30 Aug 75, 10p Rept no. TR-0076(6603)-5 SAMSO-TR-75-228
Contract F04701-75-C-0076

Descriptors: *Fluorides, *Molecular vibration, Deuterium compounds, Relaxation time, Shock tubes, Helium, Argon.
Identifiers: *Deuterium fluoride, Molecular relaxation.

The vibrational relaxation of DF by He has been measured in shock-tube experiments. The vibrational relaxation times of DF in Ar were measured near 1000 K and are in good agreement with extrapolations of previous studies at higher temperatures.

AD-A016 077/0GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
Simple Criteria for Distinguishing Between Inner- and Outer-Sphere Electrode Reaction Mechanisms,
Michael J. Weaver, and Fred C. Anson. 22 Apr 75, 4p Rept no. Contrib-5058 ARO-12034.3-C
Grant DAHC04-74-G-0170
Availability: Pub. in Jnl. of the American Chemical Society, 97 p4403-4405 1975.

Descriptors: *Electrodes, *Metal complexes, *Transition metals, *Reaction kinetics, Surface chemistry, Chemical reactions, Electron transfer, Reprints.

In recent experiments directed at understanding the effects of changes in double-layer structure on the kinetics of the electrode reactions of several transition metal complexes, a procedure for distinguishing between complexes which follow inner-sphere or outer-sphere pathways was developed. The method is extremely simple and appears to have considerable generality.

AD-A016 090/3GA PC$3.25/MF$2.25
Bartlesville Energy Research Center Okla
Thermodynamic Properties of Organic Compounds and Thermodynamic Properties of Fluids.
Final rept. 1 Jul 74-30 Jun 75,
Donald R. Douslin, William D. Good, Samuels Todd, Isham A. Hossenlopp, and Ann G. Osborn. 30 Jun 75, 18p AFOSR-TR-75-1364

Descriptors: *Calorimetry, *Thermal properties, *Thermochemistry, *Enthalpy, Vapor pressure, Heat of vaporization, Entropy, Molecular structure, Napthalenes, Cyclohexanes, Cyclopentanes, Phenols.
Identifiers: Oxetanes.

In search for molecular structures that contain higher energies than normal jet fuel liquids, nine compounds were measured by combustion calorimetry to obtain their enthalpies of combustion in the liquid state at 25C. These results show 6.0 to 24.4 percent higher heats per unit volume than a better-than-average hydrocarbon jet fuel. New measurements on the vapor heat capacity, enthalpy of vaporization, and vapor pressure of 1,3-epoxypropane (trimethylene oxide) complete a comprehensive experimental thermodynamic investigation of a small ring molecule that has high ring strain energy.

AD-A016 105/9GA PC$5.75/MF$2.25
Columbia Radiation Lab New York
Research Investigation Directed Toward Extending the Useful Range of the Electromagnetic Spectrum.
Progress rept. no. 25, 1 Jul 74-30 Jun 75,
Sven R. Hartmann, and William Happer. 30 Jun 75, 127p
Contract DAAB07-74-C-0341, Grant NSF-GH-38503

Descriptors: *Atomic spectroscopy, Scientific research, Microwave spectroscopy, Raman spectra, Superfluidity.
Identifiers: *Laser spectroscopy.

Research in the following areas are described: Atomic physics; Physics of molecules; Resonance physics; and, Macroscopic quantum physics.

AD-A016 114/1GA PC$3.75/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
DUMDUM: A Computer Code to Generate an Initial Density Matrix for Ab Initio MO-LCAO-SCF Calculations.
Final memorandum rept.,
George F. Adams. Aug 75, 41p Rept no. BRL-MR-2514

Descriptors: *Molecular orbitals, *Quantum chemistry, Computer programs, Wave functions, Nitrobenzenes.
Identifiers: *DUMDUM computer code, *Self consistant field molecular orbitals, Nitro compounds.

This report describes the development of and provides documentation for the use of a computer code named DUMDUM. The code generates an initial guess at a one-electron density matrix for use as input to an ab initio MO-LCAO-SCF calculation. The rationale for writing the code are discussed, and examples of its use are presented.

AD-A016 140/6GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Toward Knowledge of the Fluorescence of Mercury Vapor,
H. Niewodniczanski. 28 Apr 75, 21p Rept no. FTD-HC-23-1149-75
Edited trans. of Zeitschrift fuer Physik (West Germany) n4 p59-72 1929.

Descriptors: *Mercury, *Fluorescence, *Visible spectra, Metal vapors, West Germany, Translations.

In connection with results of previous work, which are briefly reported here, the emission of the line at 1849 A in the fluorescence of mercury vapor was studied with negative results. The fluorescence spectrum excited with an aluminum spark was studied with mercury vapor superheated from 245 to 910C. All the lines and bands in the fluorescence spectrum become much weaker in the presence of hydrogen, except for the band with the long-wave limit at 2349 A, which remains unchanged in intensity. The carriers of these bands are deduced from the intensity curves of the fluorescence bands. The fluorescence band with its long-wave limit at 2349 A was also studied in saturated mercury vapor. Its decrease in intensity with increasing vapor density is explained through the rising band absorption, based on the absorption records.

AECL-5025 PC$4.50/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
Deuterium Isotope Separation Factor Between Hydrogen and Liquid Water.
J. H. Rolston, J. den Hartog, and J. P. Butler.
Mar 75, 30p
U.S. Sales Only.

Descriptors: (*Deuterium, *Isotope separation), (*Hydrogen isotopes, Isotope separation), Hydrogen, Isotopic exchange, Liquids, Medium temperature, Vapors, Water.

For abstract, see NSA 32 08, number 19319.

CONF-750705-3 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Basic Aspects of Secondary Electron Distributions.
Y. K. Kim. Jul 75, 15p
Contract W-31-109-Eng-38

Descriptors: (*Helium, *Electron-atom collisions), (*Nitrogen oxides, *Electron-molecule collisions), (*Nitrogen, Electron-molecule collisions), (*Neon, Electron-atom collisions), Angular distribution, Energy spectra, Ev range 10-100, Ev range 100-1000, Hydrogen ions 1 plus, Ion-atom collisions, Ion-molecule collisions, Ionization, Kev range 01-10, Kev range 10-100, Kev range 100-1000, Scattering, Secondary emission.

For abstract, see NSA 32 08, number 20828.

COO-3040-4 PC$4.25/MF$2.25
New York Univ., N.Y. Medical Center.
Design and Construction of a Detection System for the Determination of Lead in Blood Using X-Ray Fluorescence Analysis. Progress Report, August 1, 1974--July 31, 1975.
G. R. Laurer, and T. J. Kneip. 1975, 21p
Contract AT(11-1)-3040

Descriptors: (*Blood, *Chemical analysis), (*Lead, *X-ray fluorescence analysis), (*Zinc, X-ray fluorescence analysis), (*Urine, Chemical analysis), Hemoglobin, Trace amounts.

For abstract, see NSA 32 08, number 19273.

COO-3478-14 PC$4.75/MF$2.25
State Univ. of New York, Albany.
Theory of Reaction Kinetics. Final Report, 1 June 1974--31 May 1975.
J. W. Corbett, and D. Peak. 1975, 34p

Descriptors: (*Solids, *Molecular models), Computer calculations, Diffusion, Equations, Fcc lattices, Hcp lattices, Interstitials, Lattice parameters, Nucleation, Reaction kinetics, Vacancies.

For abstract, see NSA 32 08, number 20191.

IEA-356 PC$4.00/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).

Study on the Solvent Extraction of the Lanthanide Elements, Scandium, Uranium, and Thorium Using Tetracycline as the Complexing Agent.
M. J. C. Nastasi, and F. W. Lima. Sep 74, 19p
U.S. Sales Only.

Descriptors: (*Lanthanum, *Solvent extraction), (*Cerium, Solvent extraction), (*Praseodymium, Solvent extraction), (*Neodymium, Solvent extraction), Alcohols, Aqueous solutions, Dysprosium, Erbium, Europium, Gadolinium, Holmium, Lutetium, Ph value, Promethium, Quantity ratio, Samarium, Scandium, Solvent properties, Terbium, Tetracyclines, Thorium, Thulium, Tracer techniques, Uranium, Ytterbium.

For abstract, see NSA 32 08, number 19285.

IEA-369 PC$4.00/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
Influence of Conductivity of Thin Gold Films on Proportional Counting.
L. P. Moura, and W. C. Parker. Jan 75, 9p
U.S. Sales Only.

Descriptors: (*Gold, *Electric conductivity), (*Proportional counters, *Performance), (*Radiometric analysis, *Sensitivity), Acetates, Copolymerization, Films, Gas flow, Pvc, Radioisotopes.

For abstract, see NSA 32 08, number 19274.

JUL-1170 PC$6.25/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Determination of Vanadium, Chromium, Manganese, and Arsenic in Titanium Oxide by Neutron Activation Analysis.
G. Erdtmann, and O. Aboulwafa. Feb 75, 61p
In German. U.S. Sales Only.

Descriptors: (*Vanadium, *Activation analysis), (*Chromium, Activation analysis), (*Manganese, Activation analysis), (*Arsenic, Activation analysis), Gamma spectroscopy, Neutron reactions, Solvent extraction, Titanium oxides.

For abstract, see NSA 32 08, number 19237.

LA-UR-75-1331 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Neutron Measurements of exp 234 U Isotopic Abundance in Uf sub 6 Samples.
L. R. Stieff, R. B. Walton, T. D. Reilly, L. W. Fields, and R. L. Walker. 1975, 16p CONF-750608-11
Contract W-7405-eng-36

Descriptors: (*Uranium hexafluoride, *Nuclear reaction analysis), (*Uranium 234, Nuclear reaction analysis), Alpha beams, Four-pi counting, Isotope ratio, Neutrons, Nuclear reactions, Uranium 235.

For abstract, see NSA 32 08, number 19238.

LBL-3647 PC$6.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Nonperturbative Theory of Single/Multiphoton Processes in Atoms and Molecules Induced by Intense Laser Fields.
A. M. F. Lau. Apr 75, 58p
Contract W-7405-ENG-48

Descriptors: (*Atoms, *Energy levels), (*Molecules, Energy levels), (*Lithium, *Atom-atom collisions), (*Hydrogen, Atom-atom collisions), Adiabatic processes, Cross sections, Dissociation, Energy-level transitions, Inelastic scattering, Laser radiation, Lithium hydrides, Recursion relations, Sodium, Spectral shift.

For abstract, see NSA 32 08, number 20862.

NIM-1725 PC$4.00/MF$2.25
National Inst. for Metallurgy, Johannesburg (South Africa).
Determination of Silica in Fluorspar by 14 Mev Neutron-Activation Analysis.
D. C. G. Pearton, B. T. Eddy, and D. M. Bibby. 10 Jun 75, 9p
U.S. Sales Only.

Descriptors: (*Fluorite, *Activation analysis), (*Silicon oxides, Activation analysis), Aluminium, Errors, Interfering elements, Iron, Magnesium, Mev range 10-100, Neutron reactions, Phosphorus, Quantitative chemical analysis.

For abstract, see NSA 32 08, number 19239.

N75-30277/8GA PC$12.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Tables and Charts of Equilibrium Thermodynamic Properties of Carbon Dioxide for Temperatures to 25,000 K.
S. E. Wilder, and C. G. Miller, Iii. Jul 75, 490p
NASA-TM-X-72658

Descriptors: *Carbon dioxide, *High temperature environments, *Thermodynamic equilibrium, *Thermodynamic properties, Gas temperature, Graphs (Charts), Physical properties, Tables (Data).

For abstract, see STAR 1321

N75-30279/4GA PC$3.25/MF$2.25
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Structural Studies of Silicate Anions in Aqueous Solution Using Silicon-29 Nuclear Magnetic Resonance Spectroscopy.
G. Englehardt, H. Jancke, D. Hoebbel, and W. Wieker. 1975, 7p NRC/CNR-TT-1813, ISSN-0470-2557
Tran-Transl. Into English from Z. Fuer Chem. (West Ger.), V. 14, No. 3, 1974 p 109-110.

Descriptors: *Molecular structure, *Nuclear magnetic resonance, *Silicon, *Spectroscopic analysis, Anions, Signal analysis, Spectrum analysis.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30437/8GA PC$4.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A Computer Program for Calculation of Spectral Radiative Properties of Gas Mixtures.
J. E. Nealy. Aug 75, 88p NASA-TN-D-7845, L-9745

Descriptors: *Computer programs, *Gas mixtures, *Radiative heat transfer, Radiation spectra, Thermal radiation, Thermodynamics.

For abstract, see STAR 1321

N75-30484/0GA PC$3.75/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
The Influence of Porosity and Grain Size Distribution on the Permeability Equation of Porous Flow.
H. Rumpf, and A. R. Gupte. 1975, 33p CSIR-TRANS-1208
Tran-Transl. Into English from Chemie Ing. Techn. (Weinheim), V. 43, No. 6, p 367-375.

Descriptors: *Particle size distribution, *Permeability, *Porosity, *Regression analysis, Flow distribution, Fluidized bed processors, Numerical analysis.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30670/4GA PC$4.75/MF$2.25
IIT Research Inst., Chicago, Ill.
Atmospheric Scavenging of Hydrochloric Acid.
Final Report.
E. O. Knutson, and D. L. Fenton. Aug 75, 80p
NASA-CR-2598
Contracts NAS8-30807, IITRI PROJ. C6312

Descriptors: *Hydrochloric acid, *Rocket exhaust, *Scavenging, Air pollution, Environment effects, Humidity, Rain, Solid propellant rocket engines.

For abstract, see STAR 1321

N75-30863/5GA PC$3.75/MF$2.25
Alabama A & M Univ., Normal. Dept. of Physics.
Transition Radiations in X-Ray Region.
Summary Report.
M. C. George. Jan 75, 28p NASA-CR-143381
Grant NSG-8001

Descriptors: *Electromagnetic radiation, *Electron transitions, *Mylar (Trademark), *X rays, Charged particles, Computer programming, Energy transfer, Particle interactions, Radiation sources.

For abstract, see STAR 1321

N75-30897/3GA PC$3.75
Paris Univ. (France). Lab. de Physique des Solides.
Characterization by Nuclear Microanalysis: Improvement of the Sensitivity and Correlation with Ion Probe Technique Caracterisation Par Microanalyse Nucleaire. Amelioration de la Sensibilite et Correlation Avec la Technique de Sonde Ionique.
Final Report.
G. Amsel. 1974, 26p
Contract DGRST-72-7-0016
Language in French.

Descriptors: *Backscattering, *Correlation detection, *Heavy ions, *Ion probes, *Microanalysis, Calibrating, Elastic scattering, Nucleonics, Radiation counters, Semiconductor devices, Thin films.

For abstract, see STAR 1321

PAT-APPL-601 125/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Preparation of PbO2 Anode.
Patent Application,
Filed 31 Jul 75, 12p DOCKET/MIN-2005
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Anodes, *Lead oxides, *Electrodeposition, Electrowinning.
Identifiers: Lead oxide(PbO2).

The patent application relates to the electrodeposition of metallic compounds onto another surface, and more particularly, to a method of deposition of lead dioxide onto substrate anode in an electrolyte, and to an anode produced by this method. Anodes so produced are useful in electrowinning processes for recovering metals from metal ores.

PB-244 402/4GA PC$7.25/MF$2.25
Radian Corp., Austin, Tex.
Identification of Regenerable Metal Oxide SO2 Sorbents for Fluidized-Bed Coal Combustion.
Final rept. Jun 74-Apr 75,
P. S. Lowell, and T. B. Parsons. Jul 75, 205p
EPA/650/2-75/065
Contract EPA-68-02-1319

Descriptors: *Sulfur dioxide, *Air pollution control, *Adsorbents, Fluidized bed processing, Regeneration(Engineering), Thermodynamics, Oxides, Inorganic sulfates, Aluminates, Ferrates, Reaction kinetics.
Identifiers: *Fluidized bed combustion, *Metal oxides.

The report briefly summarizes results of an analysis to identify regenerable metal oxide SO2 sorbents for fluidized-bed coal combustion. It recommends continued investigation. It discusses both the approach used for the theoretical study of sorption/regeneration processes and implications of the results. The Appendix contains two technical notes that are major products of this effort: 'Thermodynamic Screening of Dry Metal Oxides for High Temperature SO2 Removal', giving complete details of the thermodynamic analysis of the sorption process; and 'The Thermodynamics of Chemical Regeneration of Metal Oxide SO2 Sorbents,' giving detailed methods and results of the identification of sorbents that can be regenerated by reductive decomposition of the sulfate.

PB-245 076/5GA PC$3.75/MF$2.25
Pennsylvania Univ., Philadelphia. Dept. of Chemical and Biochemical Engineering.
On Predicting the Results of Affinity Procedures,
David J. Graves, and Yun-Tai Wu. Sep 73, 49p NSF/RA/T-73/026

Descriptors: *Chromatographic analysis, Enzymes, Mathematical models, Desorption, Adsorption, Chemical equilibrium.
Identifiers: Affinity chromatography, Column chromatography, *Immobilized enzymes.

This paper concerns the development of a mathematical model for the behavior of affinity chromatography columns. Simplifications are made and theoretical guidelines are developed to enable the experimenter to better understand the processes involved so that he may more readily correct or improve his separation techniques. The adsorptive and desorptive phases of affinity chromatography are analyzed individually. Within each phase, limitations based only on equilibrium relationships are considered first. Enzyme columns are used for the study.

PB-245 095/5GA PC$5.75/MF$2.25
Massachusetts Univ., Amherst.
Tubular Flow Reactor Studies of Immobilized Catalase and Glucose Oxidase.
Master's thesis,
Alan D. Traher. Jul 73, 133p NSF/RA/T-73-094

Descriptors: *Catalase, *Enzymes, Supports, Chemical reactors, Deoxygenation, Beverages, Theses, Food processing, Catalysts, Reaction kinetics.
Identifiers: *Immobilized enzymes, *Enzyme technology, Catalyst supports, *Oxidase/glucose, Continuose flow.

Catalase was immobilized on porous glass and several nickel silica alumina supports. Catalase immobilized on nickel silica alumina was studied in a tubular plug flow reactor. Several physical mixtures of singly immobilized catalase on nickel silica alumina and singly immobilized glucose oxidase on nickel silica alumina were studied in a tubular plug flow reactor under conditions simulating the removal of oxygen from fruit juice. Further studies uses simultaneously immobilized catalase and glucose oxidase on nickel silica alumina.

PB-245 097/1GA PC$4.25/MF$2.25
Purdue Univ., Lafayette, Ind. School of Chemical Engineering.
Immobilization of Whole Cells Containing Glucose Isomerase.
Master's thesis Sep 73-May 74,
Bill Juichang Chen. May 74, 64p NSF/RA/T-74/096
Grant NSF-GI-34919

Descriptors: *Enzymes, *Membranes, *Cellulose acetate, *Casting, Inclusions, Fabrication, Cells(Biology), Theses.
Identifiers: Enzyme technology, *Immobilized enzymes, *Isomerase/glucose.

Various procedures for construction of secondary cellulose acetate membranes with entrapped whole cells (containing glucose isomerase) have been developed and studied. Different effects on the behavior of the constructed membranes were noted and reported. Several methods of preparing the casting mixture for membrane construction and the effects of the composition of the casting mixture were studied. Membranes were also constructed by using different solvent systems, secondary cellulose acetates, and casting media. The numerous membranes constructed were compared in terms of their observed activities with equivalent amounts of non-immobilized whole cells. The results established that the best secondary cellulose acetate membrane preparation recipe is to use methylene chloride-acetone (6:1) as solvent with a loading ratio of cellulose acetate to whole cells of 2:1 for the casting mixture. Membranes should be cast on glass and air dried.

PB-245 107/8GA PC$5.75/MF$2.25
Purdue Univ., Lafayette, Ind. Dept. of Biochemistry.
Enzymatic Methods of Making Fructose and Selected Other Work.
Progress rept. Feb 73-Feb 74,
Alden Emery, Victor W. Rodwell, Henry C. Lim, Frederick E. Regnier, and Daniel R. Schneider. 1974, 134p NSF/RA/T-74/016
Grant NSF-GI-34919

Descriptors: *Fructose, *Enzymes, *Isomerization, Beds(Process engineering), Chemical reactors, Molecular isomerism, Cellulose acetates, Membranes, Chemical equilibrium, Inclusions, Cells(biology), Chromatographic analysis, Reaction kinetics.
Identifiers: *Enzyme technology, *Dehydrogenases, *Immobilized enzymes, *Isomerase/glucose, Paper chromatography, Enzyme activity.

Progress is reported in programs directed toward the enzymatic isomerization of glucose to fructose and the design of a NAD-dehydrogenase reactor. The fructose section reports work on basic equilibrium and kinetic data, characteristics of whole cells entrapped in cellulose acetates, data on columns containing soluble glucose isomerase immobilized on paper and agarose, affinity chromatography, and tests on the separation of fructose from glucose. The NAD-dehydrogenase reactor design has progressed in the study of the enzyme system, the substrate, the cofactor, and the cofactor regeneration.

UCRL-51857 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
An Experimental Study of Lih Stoichiometry at Elevated Temperatures and Pressures.
A. J. Piwinskii, E. M. Lilley, and G. S. Smith. 25 Jun 75, 16p
Contract W-7405-Eng-48

Descriptors: (*Lithium hydrides, *Stoichiometry), Chemical composition, High temperature, Hydrogen, Pressure dependence, Quantity ratio, Temperature dependence, Very high pressure.

For abstract, see NSA 32 08, number 20213.

UCRL-76070 PC$6.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Direct Digital Control of Electrode Potential. Application to Controlled-Potential Electrolysis Experiments.
C. L. Pomernacki, and J. E. Harrar. 7 Apr 75, 66p CONF-750410-5

Descriptors: (*Electrolytic cells, *Electrodes), (*On-line control systems, *Algorithms), Computers, Electric potential, Electrolysis, Performance, Programming, Specifications, Voltametry.

For abstract, see NSA 32 08, number 21806.

7E. Radio and Radiation Chemistry

AERE-R-8035 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Infrared and Raman Studies on Actinide(Iv) Hexahalogeno-Complexes.
D. Brown, B. Whittaker, and P. E. Lidster. May 75, 17p
U.S. Sales Only.

Descriptors: (*Thorium chlorides, *Spectra), (*Protactinium chlorides, Spectra), (*Uranium chlorides, Spectra), (*Neptunium chlorides, Spectra), Ammines, Cesium complexes, Infrared spectra, Organic arsenic compounds, Plutonium chlorides, Protactinium bromides, Protactinium iodides, Raman effect, Thorium bromides, Thorium iodides, Uranium bromides, Uranium iodides.

For abstract, see NSA 32 08, number 19371.

ANL-8153 PC$7.60/MF$2.25
Argonne National Lab., Ill.
Chemistry Division Annual Report, July 1973--June 1974.
D. F. Peppard. Jan 75, 200p
Contract W-31-109-Eng-38

Descriptors: (*Chemistry, *Research programs), (*Nuclear physics, Research programs), Actinides, Rare earths.

For abstract, see NSA 32 08, number 19372.

BNL-20210 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Physical Principles of Thermoluminescence and Recent Developments in Its Measurement.
P. W. Levy. 1974, 18p CONF-7409128-1

Descriptors: (*Age estimation, Thermoluminescence), (*Thermoluminescence, *Radioinduction), (*Archaeological specimens, Age estimation), Alpha particles, Beta particles, Crime detection, Electric charges, Electrons, Gamma radiation, Measuring methods, Physical radiation effects, Solids, Trapping.

For abstract, see NSA 32 08, number 19332.

CONF-750549-1 PC$5.25/MF$2.25
California Univ., Los Angeles Lab. of Nuclear Medicine and Radiation Biology.
Ionizing Radiation Induced Attachment Reactions of Nucleic Acids and Their Components.
L. S. Myers, Jr.. 1975, 42p
Contract AT(04-1)-GEN-12

Descriptors: (*Nucleic acids, *Chemical radiation effects), Alcohols, Amines, Bibliographies, Chemical reaction kinetics, Chemical reactions, Formates, Radicals, Radiosensitizers, Water.

For abstract, see NSA 32 08, number 19333.

CONF-750915-2 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Search for Plutonium Fluorescence.
M. A. Lyster, R. L. Fellows, and J. P. Young. 1975, 5p

Descriptors: (*Plutonium, *Fluorescence), Aqueous solutions, Chemical analysis, Chemical state, Fluorescence spectroscopy, Plutonium compounds, Tta.

For abstract, see NSA 32 08, number 19377.

COO-3126-31 PC$5.00/MF$2.25
Brooklyn Coll., N.Y. Dept. of Chemistry.
Nuclear and Radiochemical Techniques in Chemical Analysis. Progress Report, 1 June 1974--31 May 1975.
H. L. Finston, and E. T. Williams. 1975, 39p
Contract E(11-1)-3126

Descriptors: (*Nuclear chemistry, *Research programs), (*Yttrium 88, Neutron reactions), (*Cerium 139, Neutron reactions), (*Neutron reactions, *Cross sections), Mercury, Sodium 22, Solvent extraction, Solvents, Thermal neutrons, X-ray emission analysis.

For abstract, see NSA 32 08, number 19365.

COO-3221-33 PC$4.25/MF$2.25
Hebrew Univ., Jerusalem (Israel).
Catalytic Mechanism of the Manganese Containing Superoxide Dismutase of Escherichia Coli Studied by Pulse Radiolysis Technique. Progress Report, 1 September 1974--1 July 1975.
M. Pick, J. Rabani, F. Yost, and I. Fridovich. 1975, 22p
Contract AT(11-1)-3221

Descriptors: (*Formates, *Radiolysis), Aqueous solutions, Catalysis, Chemical reaction kinetics, Edta, Escherichia coli, Pulsed irradiation, Research programs.

For abstract, see NSA 32 08, number 19334.

COO-3221-34 PC$4.75/MF$2.25
Hebrew Univ., Jerusalem (Israel).
One Electron Transfer Equilibria and Redox Potentials of Radicals Studied by Pulse Radiolysis. Progress Report: Period Covered, 1 September 1974--1 July 1975.
D. Meisel, and G. Czapski. 1975, 34p
Contract AT(11-1)-3221

Descriptors: (*Quinones, *Radiolysis), (*Dyes, Radiolysis), (*Radicals, *G value), Aqueous solutions, Charge exchange, Chemical reaction kinetics, Formic acid, Gamma radiation, Oxygen, Propanols, Pulsed irradiation, Redox potential.

For abstract, see NSA 32 08, number 19335.

COO-3416-20 PC$4.25/MF$2.25
Pennsylvania State Univ., University Park Dept. of Chemistry.
Radiation Chemistry and Mass Spectrometry of Volatile Silanes and Germanes. Progress Report, June 1, 1974--May 31, 1975.
F. W. Lampe. 1975, 23p
Contract E(11-1)-3416

Descriptors: (*Silanes, *Radiolysis), (*Nitrogen oxide, Radiolysis), (*Acetone, *Chemical reaction kinetics), (*Radicals, Chemical reaction kinetics), Ethylene, Gamma radiation, Germanes, Mass spectroscopy, Research programs.

For abstract, see NSA 32 08, number 19336.

HU-TFT-75-5 PC$4.00/MF$2.25
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Electron Liquid in Collective Description. II. Application to Positron Annihilation.
J. Arponen, and E. Pajanne. Feb 75, 16p
U.S. Sales Only.

Descriptors: (*Positron collisions, *Annihilation), Bosons, Correlation functions, Electron density, Electron gas, Electron pairs, Electron-electron interactions, Electron-positron interactions, Kinetic energy, Metals, Perturbation theory, Probability, Random phase approximation, Tamm-dancoff method.

For abstract, see NSA 32 08, number 20818.

IRE-5/1973 PC$5.50/MF$2.25
Institut National des Radioelements, Brussels (Belgium).
Critical Study of the Industrial Application of gamma Radiations in the Area of Polymer Cross-Linking.
P. Dardeene, and W. Schietecatte. Dec 73, 46p
U.S. Sales Only.

Descriptors: (*Polymers, *Chemical radiation effects), Comparative evaluations, Cross-linking, Electron beams, Gamma radiation, Industry.

For abstract, see NSA 32 08, number 19338.

LA-5994-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Hadronic Atoms and Ticklish Nuclei: The E2 Nuclear Resonance Effect.
M. Leon. Jun 75, 9p

Descriptors: (*Hadronic atoms, *Energy-level transitions), (*Intermediate mass nuclei, Hadronic atoms), Attenuation, Nuclear structure, Resonance.

For abstract, see NSA 32 08, number 20819.

LBL-3857 PC$8.75/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Measurements of X-Rays and gamma -Rays from Stopped Kaons.
G. L. Godfrey. 9 May 75, 114p
Contract W-7405-ENG-48

Descriptors: (*Kaonic atoms, *X-ray spectra), (*Hadronic atoms, X-ray spectra), (*Pionic atoms, X-ray spectra), (*Kaons, *Absorption), Charged-particle transport, Elements, Hypernuclei, Isotopes.

For abstract, see NSA 32 08, number 20820.

MLM-2254(OP) PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
Model for Liquid Uranium and Plutonium with Implications on the Adjacent Solid Phases.
L. J. Wittenberg. 1975, 13p CONF-750915-9
Contract AT-33-1-GEN-53

Descriptors: (*Uranium, *Compressibility), (*Plutonium, Compressibility), Elasticity, Hard-sphere model, Liquid metals, Phase studies, Solids, Specific heat, Surface tension, Vaporization heat, Viscosity.

For abstract, see NSA 32 08, number 19378.

ORO-3106-54 PC$4.50/MF$2.25
Florida Univ., Gainesville Dept. of Chemistry.
Radiation Chemistry of Hydrocarbon and Alkyl Halide Systems. Progress Report, 1 July 1974--31 July 1975.
R. J. Hanrahan. 1975, 26p
Contract AT(40-1)-3106

Descriptors: (*Brominated aliphatic hydrocarbons, *Photolysis), (*Ethane, *Radiolysis), (*Fluorinated aliphatic hydrocarbons, Radiolysis), (*Iodinated aliphatic hydrocarbons, Radiolysis), Gamma radiation, Mixtures, Organic fluorine compounds, Research programs.

For abstract, see NSA 32 08, number 19343.

RL-75-050 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Emission of Auger Electrons in mu -Mesic Atoms and Escape of Charged Particles when mu -Mesons Are Captured by Light (C,N,O) and Heavy (Ag,Br) Nuclei.
Yu. A. Batusov, S. A. Bunyatov, L. Vizireva, G. R. Gulkanian, and F. Mirsalikhova. Mar 75, 9p
Translation of JINR--P1-8205. U.S. Sales Only.

Descriptors: (*Muonic atoms, *Auger effect), (*Carbon, Auger effect), (*Nitrogen, Auger effect), Bromine, Capture, Electron emission, Heavy nuclei, Kev range 10-100, Light nuclei, Muons, Oxygen, Silver.

For abstract, see NSA 32 08, number 20821.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-A015 972/3GA PC$3.25/MF$2.25
Woods Hole Oceanographic Institution Mass
Benthic Fauna of the Gulf of Maine Sampled by R/V GOSNOLD Cruise 179 and DSRV ALVIN Dives 329, 330, 331 and 404: Infaunal Species List.
Technical rept.,
Gilbert T. Rowe, Pamela T. Polloni, and R. Lee Haedrich. Jul 75, 10p Rept no. WHOI-75-38
Contract N00014-71-C-0284, Grant NSF-GA-31235

Descriptors: *Aquatic animals, *Ecology, *Maine Gulf, Invertebrates, Ocean bottom sampling, Abundance, Distribution, Tables(Data), Oceanographic ships, Cores, Marine biology.
Identifiers: Alvin vessel, Gosnold vessel.

Bottom samples were collected in the Gulf of Maine during July, 1971 and June, 1972 using DSRV ALVIN and R/V GOSNOLD. The purpose of this technical report is to put those raw data in a form available (on request from the authors) to any interested ecologists.

AD-A016 245/3GA PC$3.75/MF$2.25
American Inst of Biological Sciences Arlington Va
Workshop on Problems of Assessing Populations of Nekton Held at Santa Barbara, California on February 25-27, 1975.
Final rept.,
W. G. Pearcy. 1 Aug 75, 36p ONR-ACR-211
Contract N00014-70-A-0140-0003

Descriptors: *Aquatic animals, *Fishes, California, Workshops(Meetings), Remote detectors, Population, Sampling, Acoustics, Quantitative analysis, Marine biology, Ecology, Oceanography, Collecting methods.
Identifiers: Santa Barbara(California), Ecosystems, *Shrimps, *Squids.

A workshop was held in Santa Barbara, California, to discuss problems associated with assessing the populations of nekton or strongly swimming animals such as squids, shrimps and fishes. Sessions were held to discuss four major methods of assessing nekton populations: (1) Net collections, (2) Acoustics, (3) Egg/larval surveys, (4) Visual methods, remote sensing and feeding habit studies. An attempt was made to review the state of the art for each

method including advantages, disadvantages and an evaluation of the accuracy of assessment. In addition, an attempt was made to identify important scientific problems and to recommend areas for future research and development.

8B. Cartography

N75-30638/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Procedure for Locating 10 Km Utm Grid on Alabama County General Highway Maps.
C. T. N. Paludan. 7 Aug 75, 22p NASA-TM-X-64953

Descriptors: *Alabama, *Cadastral mapping, *Mercator projection, Interpolation, Latitude, Longitude, Tables (Data).

For abstract, see STAR 1321

8C. Dynamic Oceanography

AD-A015 620/8GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Further Results on Nonlinear Energy Transfer in Gravity-Capillary Wave Spectra, with Viscous Considerations,
Gaspar R. Valenzuela. 17 Sep 75, 20p Rept no. NRL-7913

Descriptors: *Ocean waves, *Air water interactions, Viscous flow, Electromagnetic scattering, Partial differential equations, Radio waves, Energy transfer, Nonlinear systems.
Identifiers: Radiative transfer, Gravity waves.

Further studies have been made on the effect of viscosity and on the spectral-shape dependence on the energy flux of a gravity-capillary spectrum. Viscous effects have been included as a perturbation of the inviscid results and also in a more exact manner, producing an effective decoupling of gravity and capillary waves, suggesting that the growth of gravity-capillary waves in the front face of the spectrum must be mostly dependent on the energy flux from the wind. However, at an early stage of development, the nonlinear resonant interactions may still play a significant contribution to the growth of the gravity-capillary wave spectrum. The investigation is concluded with a brief description on the effect of nonlinear resonant interactions and surface tension to the second-order contributions to the doppler spectrum of radio waves backscattered from a water-wave system.

AD-A015 653/9GA PC$5.75/MF$2.25
Informatics Inc Rockville Md
Soviet Material on Internal Wave Effects, No. 4, September 1975,
Stuart G. Hibben, John Kourilo, B. L. Shresta , and M. Ness. Sep 75, 147p
Contract MDA903-76-C-0099, DARPA Order-3097
See also report dated Apr 75, AD-A007 913.

Descriptors: *Ocean waves, *Internal waves, *Bibliographies, Abstracts, USSR.

This is the fourth collection of abstracts of recent Soviet articles on generation and detection of internal waves. It is based on items listed in the fourth Bibliography of Soviet Material on Internal Waves, published June 6, 1975 and covers material received from January through May 1975. The abstracts are divided into internal effects, and surface effects comprising active and passive measurement of wave states.

AD-A015 786/7GA PC$3.25/MF$2.25
Virginia Inst of Marine Science Gloucester Point
Development of the Turbidity Maximum in the Rappahannock Estuary Summary,
Maynard M. Nichols. 1974, 9p ARO-8524.1-EN
Grant DA-ARO-D-31-124-70-G47
Availability: Pub. in Memoires de l'Institut de Geologie du Bassin d'Aquitaine, n7 p19-25 1974.

Descriptors: *Sediment transport, *Estuaries, *Turbidity, *Sedimentation, Salinity, Spatial distribution, Turbulence, Floods, Mixing, Sediments, Seasonal variations, Virginia, Chesapeake Bay, Swamps, Convergence, Velocity, Tides, Reprints.
Identifiers: Rappahannock River.

The dynamic behavior of the turbidity maximum in the Rappahannock Estuary of the Chesapeake region has been traced through a full life cycle with changes in river inflow and haline mixing. At all levels of inflow the maximum resides within the estuary. Its locus lies just upstream of the 1 pt/thousand isohaline and its position shifts upstream with penetration of the salt intrusion. Development follows a sequence beginning with high inflow or a major seaward surge of turbulent flood water: (1) Formation of an enriched turbid aureole with near-surface and near-bottom maxima and a lean core at mid-depth, (2) Progressive upstream migration and vertical (i.e. turbid) homogeneity in a narrow zone, (3) Local intensification near the bottom with a partly layered structure, (4) Slow decay and dispersion over a broad zone. The maximum reappears with each seasonal (spring) inflow and it subsists for a life span of 4-16 weeks as estuarine mixing increases. Time-series observation of velocity over 16 to 26 tidal cycles through the maximum define a near-bottom convergence or node where river and estuarine flow meet. Measurements of residual sediment transport show a significant amount of suspended sediment accumulates in the maximum, approximately four times the river load, despite losses by downstream advection in near-surface water, diffusion and settling-out on the bottom or in border marshes. The observations point to river inflow as the chief factor controlling position of the maximum and its intensity is supported by the strength of the river-estuarine convergence and by the supply of river-borne sediment including resuspended and redistributed material. (Author)

AD-A015 800/6GA PC$4.75/MF$2.25
Lamont-Doherty Geological Observatory Palisades N Y
The Instrumented Neutrally-Buoyant Float Program at Columbia University.
Technical summary rept. Dec 68-May 75,
T. E. Pochapsky. Aug 75, 88p Rept no. TR-3
Contract N00014-67-A-0108-0011

Descriptors: *Floats, *Ocean currents, *Internal waves, *Oceanographic equipment, Turbulence, Measurement, Deep water, Kinetic energy, Housings(Enclosures), Hydrophones, Transponders, Buoyancy, Radio transmitters, Diagrams, Electronic equipment, Accuracy, Data acquisition, Experimental data.
Identifiers: Design.

Instrumented neutrally-buoyant floats were used in a series of experiments performed over a number of years starting at the Hudson Laboratories of Columbia University in 1957. This report reviews the scientific motivations for such experiments along with the continued instrument development required. Most of the scientific aspects of this work have been reported in previous publications by the author but little has been presented on the type of instrumentation and on the methods of acquiring and processing data. One of the purposes of this review is to present essential details of those experimental aspects.

AD-A016 219/8GA PC$3.75/MF$2.25
Woods Hole Oceanographic Institution Mass
Vector Averaging Current Meter Speed Calibration and Recording Technique.
Technical rept.,
James R. McCullough. Sep 75, 50p Rept no. WHOI-75-44
Contracts N00014-66-C-0241, N00014-74-C-0262

Descriptors: *Oceanographic equipment, *Flowmeters, Ocean currents, Vector analysis, Velocity, Calibration, Rotors, Recording systems, Rotation.

This report provides a discussion of the speed calibration equations used at the Woods Hole Oceanographic Institution (WHOI) for the WHOI-AMF vector averaging current meter (VACM) and the recording technique used in the instrument.

8E. Geodesy

AD-A015 768/5GA PC$3.75/MF$2.25
Ohio State Univ Columbus Dept of Geodetic Science
Formulas and Fortran Programs to Determine Zonal Coefficients from Satellite Observations,
Klaus-Peter Schwarz. May 75, 38p Rept nos. DGS-222, Scientific-24 AFCRL-TR-75-0341
Contract F19628-72-C-0120
Prepared in cooperation with Technische Hochschule, Graz (Austria).

Descriptors: *Geodesy, Signal processing, Scientific satellites, Least squares method, Computations, Computer programs.
Identifiers: Collocation method, PERCO computer program.

Following a proposal by Moritz and Schwarz the collocation method is applied to determine zonal coefficients from satellite observations. The perturbation equations are specialized from Kaula's more general formulas and are supplemented by a recurrence relation for the inclination function. The computational formulas for the collocation procedure are summarized and a method is given to determine the optimal number of coefficients by an eigenvalue analysis of the error covariance matrix. Two programs have been developed. The first one computes the coefficients of the perturbation equation, the second one determines the collocation solution and performs the accuracy analysis.

AD-A015 813/9GA PC$4.25/MF$2.25
Dba Systems Inc Melbourne Fla
Skylab Altimetry Data Reductions and Development of Programs for Pre and Post Processing of Altimetry Data for SARRA Reductions.
Final rept. Nov 74-Jun 75,
Jerry E. Trotter. Jun 75, 60p AFCRL-TR-75-0359
Contract F19628-75-C-0090

Descriptors: *Geoids, *Geodesy, Scientific satellites, Data processing, Computer programming.
Identifiers: Puerto Rico Trench, SARRA computer program, GEOS-C satellite, Skylab program.

The reductions of the skylab altimetry data offered the first opportunity to reduce real data with the SARRA computer program. The results from residual evaluations clearly illustrate the presence of a severe undulation in the vicinity of the Puerto Rico Trench. Pre and post processing programs were developed to supplement the operation of the program SARRA and to assist in the evaluation and presentation of the geoid results obtained from SARRA reductions.

AD-A015 828/7GA PC$5.25/MF$2.25
Dba Systems Inc Melbourne Fla
The Combination of Gravity and Satellite Altimetry Data for Determining the Geoid Surface.
Final rept. Nov 74-Aug 75,
Georges Blaha. Aug 75, 115p AFCRL-TR-75-0347
Contract F19628-75-C-0069

Descriptors: *Geoids, Gravity, Mathematical models, Least squares method, Scientific satellites.
Identifiers: *Gravimetric geodesy.

A recent report by Brown (1973) initiated a new approach to satellite altimetry adjustment, in the sense that highly accurate reference orbits are no longer required. Computer simulations indicated that in this way, global oceanic geoid accurate to within 1 to 2 meters rms may be determined from the reduction of GEOS-C satellite observations. However, worthwhile geoidal accuracies cannot be obtained over land masses from the reduction of satellite altimetry alone.

AD-A015 832/9GA PC$6.25/MF$2.25
Hughes Research Labs Malibu Calif
Prototype Moving Base Rotating Gravity Gradiometer.
Final rept. 1 Feb 72-30 Apr 75,
Charles B. Ames, Robert L. Forward, Philip M. LaHue, Larry R. Miller, and Robert W. Peterson. May 75, 167p AFCRL-TR-75-0362
Contract F19628-72-C-0222, ARPA Order-1838
See also AD-760 799.

Descriptors: *Gradiometers, Geodesy, Signal processing, Circuits, Transducers.
Identifiers: *Gravity gradiometry.

This report documents the accomplishments of a 39 month contract to develop a prototype Rotating Gravity Gradiometer (RGG) for moving base applications.

N75-30696/9GA PC$3.75/MF$2.25
Smithsonian Astrophysical Observatory, Cambridge, Mass.
Revision of Geodetic Parameters.
E. M. Gaposchkin, and M. R. Williamson. Aug 75, 26p NASA-CR-143331
Contract NGR-09-015-002

Descriptors: *Geopotential, *Gravitational fields, *Laser applications, Data reduction, Laser altimeters, Orbit perturbation, Satellite orbits, Satellite tracking.

For abstract, see STAR 1321

N75-30758/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Sea Surface Determination from Space: The Gsfc Geoid.
F. O. Vonbun, J. Mcgoogan, J. Marsh, and F. Lerch. Aug 75, 14p NASA-TM-X-70959, X-900-75-216
Conf-Presented at the 1974 Usnc/URSI- IEEE Meeting, Boulder, Colo., 14-17 Oct.

Descriptors: *Geoids, *Ocean surface, *Satellite observation, *Skylab 1, Error analysis, Numerical analysis, Orbital mechanics, Satellite tracking.

For abstract, see STAR 1321

PB-245 426/2GA PC$3.25/MF$2.25
Geological Survey, Menlo Park, Calif.
Gravity Data in Crump Geyser Area, Oregon.
Final rept.,
Donald Plouff. Sep 75, 18p USGS/GD-75/019

Descriptors: *Gravity anomalies, *Observed gravity, Gravimetric prospecting, Tables(Data), Statistical data, Oregon.
Identifiers: Bouguer gravity anomalies.

A total of 356 gravity stations were established in the Crump Geyser area, Oregon. The purpose of the gravity survey was to provide background geophysical information to assist in evaluating the geothermal resource potential of this area. Standard gravity reduction procedures were used to obtain values of the observed gravity, free air anomaly, and Bouguer anomalies.

8F. Geography

N75-30617/5GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
Earth Resources: A Continuing Bibliography with Indexes, Issue 2.
Mar 75, 140p NASA-SP-7041(02)

Descriptors: *Bibliographies, *Data acquisition, *Earth resources, *Indexes (Documentation), *Remote sensors, Agriculture, Data processing, Earth resources program, Marine resources, Multispectral band scanners, Oceanography, Satellite observation, Satellite-borne photography.

For abstract, see STAR 1321

N75-30628/2GA PC$4.75/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Skylab Program Earth Resources Experiment Package: Ground Truth Data for Test Sites (SI-2).
15 Aug 75, 85p NASA-CR-141910, MSC-05531
Contract NAS8-24000

Descriptors: *Erep, *Ground truth, *Sites, *Skylab program, Calibrating, Deserts, Lakes, Meteorological instruments, Meteorological parameters, Reflectance, Solar radiation, Tables (Data).

For abstract, see STAR 1321

N75-30629/0GA PC$1.45/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Monterey Bay Study.
R. M. Bizzell, and L. C. Wade. 1975, 33p NASA-SP-359, LC-74-600138
Misc-Original Contains Color Illustrations.

Descriptors: *Data processing, *Landsat 1, *Monterey bay (Ca), *Multispectral band scanners, Agriculture, Computer techniques, Imaging techniques, Land use, Photointerpretation, Resources management, Technology utilization.

For abstract, see STAR 1321

N75-30630/8GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Landsat: Us Standard Catalog No. U-35.
31 Jul 75, 71p NASA-TM-X-72459

Descriptors: *Landsat satellites, *Satellite orbits, *Satellite-borne photography, Coordinates, Data bases, Data processing, Microfilms, Tables (Data), United states of america.

For abstract, see STAR 1321

N75-30631/6GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Landsat Non-US Standard Catalog No. N-35.
31 Jul 75, 137p NASA-TM-X-72458

Descriptors: *Landsat satellites, *Satellite orbits, *Satellite-borne photography, Coordinates, Data bases, Data processing, Microfilms, Tables (Data).

For abstract, see STAR 1321

8G. Geology and Mineralogy

AD-A015 676/0GA PC$9.50/MF$2.25
Hawaii Inst of Geophysics Honolulu
Sediment Core Descriptions: R/V KANA KEOKI 1971 Cruise, Eastern and Western Pacific Ocean.
J. E. Andrews, and Jerome A. Foreman. 30 Jun 75, 332p Rept nos. HIG-75-15, HIG-Data-28
Contract N00014-70-A-0016-0001, Grant NSF-GX-28674

Descriptors: *Ocean bottom, *Sediments, Cores, Pacific Ocean, Ocean bottom sampling, Core sampling, Marine geology, Deep oceans, Lithology, Texture, Stratigraphy, Oceanographic data, Oceanographic ships, Hawaii, Geologic age determination.
Identifiers: Eastern Pacific Ocean, Western Pacific Ocean, Kana Keoki vessel.

Megascopic descriptions are presented of deep sea sediment cores obtained on cruises of the R/V KANA KEOKI in the eastern and western Pacific Ocean during 1971. Location of ship tracks and coring stations are shown. Corrected satellite navigation determined coordinates for each coring operation are indicated, and water depth, length of core, and age of oldest sediment in the cores are given. Descriptions include structural and lithologic sequences in each core, as well as a breakdown of the sedimentary units of each core as determined by microscopic examination. Diagrams of sedimentary structures and boundaries are included along with descriptions of color variations and textural variations. This Institute's sediment analysis procedure is described briefly.

AD-A015 829/5GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
Theoretical Investigation of Electrical Resistivity and Strength in situ.
Final rept. 1 Jan 74-31 Apr 75,
J. B. Walsh. 31 May 75, 37p AFCRL-TR-75-0350
Contract F19628-74-C-0139

Descriptors: *Rock mechanics, *Electrical resistivity, Test methods, Strength(Mechanics), Measurement, Anisotropy.

Strength and electrical resistivity in situ are probably not strongly related. Strength depends upon the lengths of cracks in the formation, and therefore it is sensitive to the presence of joints or faults. Expressions for the effect of cracks upon electrical resistivity are derived here by assuming they are penny-shaped ellipsoids isolated in an infinite matrix or as thin films running through the sample. The expressions suggest that resistivity depends upon porosity rather than crack length, and that joints probably do not affect the overall electrical characteristics of a formation appreciably.

AD-A016 012/7GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
A Review of the Properties of Acoustic Surface Wave Materials,
A. J. Slobodnik, Jr. 1974, 17p Rept no. AFCRL-TR-75-0531
Availability: Pub. in Optical and Acoustical Micro-Electronics, p205-220 1974.

Descriptors: *Acoustic materials, *Surface waves, Diffraction, Anisotropy, Single crystals, Quartz, Bismuth compounds, Germanium compounds, Oxides, Acoustic delay lines, Ultrahigh frequency, Beam steering, Acoustic attenuation, Transducers, Reprints.
Identifiers: *Saw materials, *Surface acoustic waves, Lithium niobate.

The various material design parameters which must be considered in order to obtain optimum surface wave device performance in the uhf and microwave frequency regions are reviewed. Combined beam steering, diffraction loss curves are provided as a function of the basic material parameter, the slope of the power flow angle. Methods for designing optimum uniform periodic interdigital transducers including finger ohmic loss, lossy tuning elements, and parasitic capacitance have been extended to account for beam steering and diffraction. A minimal diffraction orientation on Bi12GeO20 having diffraction retarded by at least two orders of magnitude over isotropic materials is discussed. The presently available tradeoffs between temperature sensitivity and coupling coefficients are also presented. (Author)

AD-A016 015/0GA PC$3.25/MF$2.25
Woods Hole Oceanographic Institution Mass
Compilation of Radiometric Ages from the ryukyu Arc Region.
Technical rept.,
Carl Bowin. Aug 75, 24p Rept no. WHOI-75-39
Contract N00014-74-C-0262, Grant NSF-GF-39029

Descriptors: *Ryukyu Islands, *Geologic age determination, Ocean bottom topography, Volcano Islands, Volcanoes, Metamorphic rock, Igneous rock, North Pacific Ocean.

This report presents a compilation of radiometric ages of rocks from the Ryukyu Arc region. Pertinent information on radiometric ages for intrusive and volcanic igneous rocks, and for metamorphic rocks are tabulated and maps summarize their areal distribution.

AD-A016 086/1GA PC$3.75/MF$2.25
Northwestern Univ Evanston Ill Dept of Geological Sciences
On the Significance of Certain Markovian Features of Granite Textures,
E. H. Timothy Whitten, and Michael F. Dacey. 4 Apr 74, 28p ARO-9894.10-EN
Grant DA-ARO-D-31-124-72-G54
Availability: Pub. in Jnl. of Petrology, v16 n2 p429-453 Jun 75.

Descriptors: *Petrology, *Markov processes, *Crystal structure, *Minerals, *Granite, Agglomerates, Crystallization, Probability, Mathematical models, Simulation, Quartz, Nucleation, Feldspar, Reprints.
Identifiers: *Markov chains, *Magma, Aggregates.

In a series of publications, Vistelius and coworkers gave important demonstrations that the succession of feldspars and quartz grains on line traverses through many granites have the Markov property. This study evaluates the characteristics, constraints, and implications of the Markov-chain model to mineral-grain transitions. Vistelius and coworkers' petrogenetic justification of the Markovian property is rejected because it does not incorporate numerous essential features. The Markov property is believed to reflect petrologically important but unidentified factors. Empirical analyses of grain-transition probabilities need extending in order to delimit the types of rocks having the Markov property and in an attempt to elucidate their petrogenetic significance. Simulation of the three-dimensional crystallization of magmas and of greenschist-facies aggregates, on the basis of probable nucleation and crystallization rates of the silicates involved, should permit the grain-transition probabilities to become meaningful. Previously, the x sq statistic has been used as a mapping variable (markovity) and as a basis for classifying degrees of mild metasomatic alteration of granites; however, this usage has no interpretable meaning. The apparent correlation of high markovity values with tin-bearing and other metasomatic rocks may mean that the x sq statistic is a surrogate for an important variable that is specifically related to degree of metasomatism. (Author)

AD-A016 215/6GA PC$3.25/MF$2.25
Lamont-Doherty Geological Observatory Palisades N Y
Ammonite-Rich Oxfordian Limestones from the Base of the Continental Slope off Northwest Africa.
Journal articles,
Otto Renz, Ralph Imlay, Yvas Lancelot, and William B. F. Ryan. 1975, 21p Rept no. LDGO-2224
Contract N00014-67-A-0108-0004, Grant NSF-GA-27281
Availability: Pub. in Eclogae Geologicae Helvetiae, v68 n2 p431-448 Jul 75.

Descriptors: *Paleontology, *Continental slopes, Limestone, Cephalopoda, Atlantic Ocean, Morocco, Tectonics, Ocean bottom topography, Reprints.
Identifiers: Ammonites.

During a recent cruise of R/V VEMA off the Moroccan continental margin, ammonite-rich limestones were dredged from the lower part of the Mazagan Escarpment. The macrofauna indicates a Middle Oxfordian age (Gregoryeeras transverarium zone) that corresponds to the first major Mesozoic marine transgression in southwestern Morocco, the Nova Scotia Shelf and the Gulf of Mexico region. These facies might reflect an abrupt flooding of the young Atlantic rift after a period of dessication during which evaporites were deposited on both the continental edge and a deeper oceanic floor. (Author)

LA-UR-75-1127 PC$4.25/MF$2.25
Los Alamos Scientific Lab., N.Mex.
U.S. Studies of the Oklo Phenomenon.
G. A. Cowan, E. A. Bryant, W. R. Daniels, and W. J. Maeck. 1975, 22p CONF-750641-2
Contract W-7405-ENG-36

Descriptors: (*Gabon, Uranium deposits), (*Uranium deposits, *Chain reactions), Criticality, Isotope ratio, Mathematical models, Uranium ores.

For abstract, see NSA 32 08, number 19700.

N75-30640/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Annual Review of Earth Observations from Space.
W. Nordberg. Aug 75, 16p NASA-TM-X-70957, X-900-75-208
Conf-Presented at the 18TH Plenary Meeting of Cospar, Varna, Bulgaria, 3 Jun. 1975.

Descriptors: *Earth (Planet), *Satellite observation, Atmospheric circulation, Geophysics, Global atmospheric research program, Landsat satellites, Nimbus satellites, Polar caps.

For abstract, see STAR 1321

N75-30702/5GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Quantification of Geologic Lineaments by Manual and Machine Processing Techniques.
M. H. Podwysocki, J. G. Moik, and W. C. Shoup. Jul 75, 28p NASA-TM-X-70951, X-923-75-183
Subm-Submitted for Publication. Conf-Presented at NASA Earth Resources Symp., Houston, Texas, June 1975.

Descriptors: *Artificial intelligence, *Data processing, *Geological faults, *Geological surveys, *Landsat satellites, *Mapping, Algorithms, Computer techniques, Imagery, Maps, Operators (Mathematics), Terrain analysis.

For abstract, see STAR 1321

N75-30704/1GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
On the Magnon Energy in Haematite. 1: Magnon Energy of the Optical Mode and the Morin Phase Transition.
N. L. Bonavito, O. Nagai, and T. Tanaka. Jun 75, 29p NASA-TM-X-70943, X-932-75-150

Descriptors: *Hematite, *Magnons, *Transition temperature, Antiferromagnetism, Ferromagnetism, Magnetic anomalies.

For abstract, see STAR 1321

8H. Hydrology and Limnology

AD-A016 078/8GA PC$3.25/MF$2.25
Wyoming Univ Laramie Dept of Geology
Clastic Sedimentation in a Modern Alpine Lake,
David Mankiewicz, James R. Steidtmann, and Leon E. Borgman. 1975, 9p ARO-10087.1-EN
Grant DA-ARO-D-31-124-72-G76
Availability: Pub. in Jnl. of Sedimentary Petrology, v45 n2 p462-468 Jun 75.

Descriptors: *Sedimentation, Sediments, Traps, Lakes, Minerals, Sources, Factor analysis, Sediment transport, Selection, Downstream flow, Drainage, Wyoming, Mountains, Limnology, Mineralogy, Reprints.
Identifiers: Alpine environment, Heavy minerals.

The redistribution of sediment by lacustrine processes operating in Green Lake, Teton County, Wy., was studied to determine the factors which control sediment entrapment and to evaluate the effectiveness of entrapment as a control on downstream sediment mineralogy. Sediment patterns in the lake were identified by factor analysis of heavy minerals data. Results show that detritus from sedimentary sources to the west is trapped in the lake, whereas sediment derived from Precambrian crystalline rocks to the east is carried through the lake and out the outlet. These relations are controlled by drainage slope and pattern, lake geometry and bathymetry, and source lithology. Because of selective sediment entrapment, it would not be possible to predict the source rock compositions in Green Lake Basin by examining the mineralogy of downstream sediments.

AERE-PR/EMS-2 PC$7.25/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Environmental and Medical Sciences Division Progress Report, January--December 1974.
J. E. Johnston. May 75, 83p
U.S. Sales Only.

Descriptors: (*Aere, *Environment), (*Tritium, *Personnel dosimetry), Air pollution, Chemical analysis, Fallout, Inhalation, Radiation monitoring, Retention, Whole-body counting.

For abstract, see NSA 3208

BNWL-SA-5385 PC$4.25/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Some Statistical Design and Analysis Aspects for Naeg Studies.
R. O. Gilbert, and L. L. Eberhardt. 1975, 21p
CONF-750548-1

Descriptors: (*Nevada test site, *Nuclear explosions), (*Plutonium, *Distribution), (*Soils, *Radionuclide migration), (*Plants, *Radionuclide kinetics), Animals, Ecology, Planning, Sampling, Statistics.

For abstract, see NSA 32 08, number 19713.

BNWL-SA-5403 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Techniques for Long-Term Controlled Studies of Plant Uptake of Transuranics.
W. T. Hinds, and J. F. Cline. 1975, 17p CONF-750503-26

Descriptors: (*Transuranium elements, *Radiation monitoring), (*Soils, *Radionuclide migration), (*Plants, *Radionuclide kinetics), Hapo, Measuring methods, Research programs, Terrestrial ecosystems.

For abstract, see NSA 32 08, number 19756.

COM-75-11387/8GA PC$4.25/MF$2.25
National Weather Service, Silver Spring, Md. Office of Hydrology.
The Flood of April 1974 in Southern Mississippi and Southeastern Louisiana.
Technical memo.,
Edwin H. Chin. Aug 75, 52p NOAA-TM-NWS-HYDRO-24 NOAA-75091702

Descriptors: *Floods, *Flooding, Precipitation(Meteorology), Volume, Drainage, Storms, Damage, Squalls, Rainfall intensity, Atmospheric circulation, Mississippi, Louisiana.
Identifiers: *Flash floods, Peak discharge, Flood data.

The flood of April 1974 over the Pascagoula and Pearl River Basins in southern Mississippi and southeastern Louisiana ranks among the most severe in terms of crest stages and maximum flood discharges reached. The objectives of the report are to present the meteorological events associated with the flood, in particular the precipitation distribution, and to give a concise account of the flood itself. Emphasis will be placed on events in southern Mississippi, where heaviest storm precipitation fell and where flooding was most severe. This flood was mainly the result of a storm that covered Louisiana, Mississippi, and western Alabama on April 11-15, 1974. Significant incursion of tropical maritime air mass into the region occurred prior to and during the storm. Amounts exceeding the 100-yr rainfall were observed at some places in southern Mississippi and at least one site in Louisiana.

COM-75-11395/1GA PC$10.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
Rainfall-Runoff as Spatial Stochastic Processes: Data Collection and Synthesis,
Rafael L. Bras, and Ignacio Rodriguez-Iturbe. Jan 75, 384p* 196, R75-5 NOAA-75091809
Contracts C-4-36738, DI-14-31-0001-9021

Descriptors: *Rainfall, *Runoff, *Flood forecasting, Stochastic processes, Rainfall intensity, Optimization, Mathematical models, Sampling, Computer programs, Weather forecasting, Correlation techniques, Storms, Theses.
Identifiers: *Storm water runoff.

This work recognizes rainfall and runoff as multidimensional stochastic processes. Using the knowledge of such processes, a procedure for designing an optimal network to measure the total precipitation of an event over a fixed area is given. The methodology used in this static problem allows consideration of the following aspects of network design: (1) Spatial correlation of process (2) errors of measurement techniques and their correlation (3) nonhomogeneous sampling costs. Optimal networks are given in terms of the number and location of stations together with the resulting cost and mean square error of estimation. The relation between rainfall and runoff is recognized as a dynamic problem. A statistically nonstationary, multi-dimensional rainfall generator is suggested. The suggested rainfall model is used together with a runoff model to study the accuracy of discharge prediction as a function of the rainfall sampling network.

CONF-720805-P1 PC$10.60/MF$2.25
Rice Univ., Houston, Tex.
Natural Radiation Environment II. Volume I. Proceedings of the Second International Symposium, August 7--11, 1972, Houston, Texas.
J. A. S. Adams, W. M. Lowder, and T. F. Gesell. 1972, 460p

Descriptors: (*Natural radioactivity, *Meetings), (*Environment, Natural radioactivity), Leading abstract, Proceedings.

For abstract, see NSA 32 08, number 19714.

CONF-720805-P2 PC$13.60/MF$2.25
Rice Univ., Houston, Tex.
Natural Radiation Environment II. Volume II. Proceedings of the Second International Symposium, August 7--11, 1972, Houston, Texas.
J. A. S. Adams, W. M. Lowder, and T. F. Gesell. 1972, 959p

Descriptors: (*Natural radioactivity, *Meetings), Environment, Leading abstract, Proceedings.

For abstract, see NSA 32 08, number 19722.

CONF-750646-1 PC$6.75/MF$2.25
Oak Ridge National Lab., Tenn.
Defining and Determining the Significance of Impacts: Concepts and Methods.
S. W. Christensen, W. Van Winkle, and J. S. Mattice. 1975, 71p

Descriptors: (*Ecosystems, *Quality control), (*Air pollution, *Environmental effects), (*Land pollution, Environmental effects), (*Water pollution, Environmental effects), Biological models, Chemical effluents, Contamination, Environment, Mathematical models, Radioactive effluents, Thermal effluents.

For abstract, see NSA 32 08, number 19706.

COO-3566-11 PC$8.25/MF$2.25
Woods Hole Oceanographic Institution, Mass.
Distribution of Lead-210 and Polonium-210 Between Soluble and Particulate Phases in Seawater.
D. W. Spencer. 1975, 105p

Descriptors: (*Lead 210, *Radiometric analysis), (*Polonium 210, Radiometric analysis), (*Seawater, Radiometric analysis), (*Gulf of maine, *Radionuclide migration), Atlantic ocean, Depth, Oceanography, Particles, Plankton, Radionuclide kinetics, Salinity, Sampling, Sediments, Solubility, Temperature measurement.

For abstract, see NSA 32 08, number 19753.

DP-MS-75-75 PC$4.00/MF$2.25
Savannah River Ecology Lab., Aiken, S.C.
Environmental Sciences and Computations: A Modular Data Based Systems Approach.
T. V. Crawford, and C. E. Bailey. Jul 75, 14p
CONF-750706-8
Contract AT(07-2)-1

Descriptors: (*Savannah river plant, *Radioactive effluents), (*Man, *Radiation doses), (*Radioactive wastes, *Environmental effects), Computer calculations, Computer codes, Data acquisition, Radioisotopes.

For abstract, see NSA 32 08, number 19733.

HASL-294 PC$10.60/MF$2.25
Energy Research and Development Administration, New York Health and Safety Lab.
Health and Safety Laboratory Environmental Quarterly, March 1, 1975--June 1, 1975.
E. P. Hardy, Jr.. 1 Jul 75, 282p

Descriptors: (*India, *Fallout), (*Greece, Fallout), (*New zealand, Fallout), (*Usa, Fallout), Cesium 137, Diet, Drinking water, Earth atmosphere, Environment, Krypton 85, Milk, Radiation monitoring, Radioactivity, Sampling, Stratosphere, Strontium 90, Surface air, Air pollution, Chlorinated aliphatic hydrocarbons, Fluorinated aliphatic hydrocarbons, Sulfur fluorides.

For abstract, see NSA 32 08, number 19734.

HASL-294(App.) PC$10.60/MF$2.25
Energy Research and Development Administration, New York Health and Safety Lab.
Appendix to Health and Safety Laboratory Environmental Quarterly (March 1--June 1, 1975).
1 Jul 75, 511p

Descriptors: (*Strontium 89, *Radiation monitoring), (*Strontium 90, Radiation monitoring), (*Beryllium 7, Radiation monitoring), (*Zirconium 95, Radiation monitoring), Atmospheric precipitations, Cerium 144, Cesium 137, Drinking water, Fallout deposits, Lead 210, Milk, New york city, Plutonium 238, Plutonium 239, Sampling, Surface air, Air pollution, Lead.

For abstract, see NSA 32 08, number 19735.

KFK-2103UF PC$12.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Angewandte Systemtechnik und Reaktorphysik.
Summary of the Environmental Effects Caused in the German Federal Republic by the Production and Consumption of Energy and the Legislative and Technical Measures for Their Reduction.
G. Haury, W. Schikarski, and E. Thoene. Dec 74, 177p
In German. U.S. Sales Only.

Descriptors: (*German federal republic, *Environment), (*Nuclear power plants, *Environmental effects), (*Fossil-fuel power plants, Environmental effects), (*Human populations, *Health hazards), Air pollution, Chemical effluents, Laws, Radiation protection, Radioactive effluents, Radioactivity, Surface air, Surface waters, Thermal pollution, Water pollution.

For abstract, see NSA 32 08, number 19736.

LA-UR-75-872 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Theoretical, Analytical, and Statistical Interpretation of Environmental Data.
S. M. Lombard. 1974, 16p CONF-7406104-1
Contract W-7405-eng-36

Descriptors: (*Plutonium 239, *Abundance), (*Environment, Radiation monitoring), (*Radiation monitoring, *Errors), (*Soils, Radiation monitoring), Data, Radiochemical analysis, Sampling, Statistics.

For abstract, see NSA 32 08, number 19737.

N75-30641/5GA PC$3.75/MF$2.25
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
The Contribution of Agriculture to the Eutrophication of Swiss Waters. Part 1: Results of Direct Measurements in the Drainage Area of Various Channels.
R. Gaechter, and O. J. Furrer. 1975, 34p
NRC/CNR-TT-1809-PT-1, ISSN-0470-2557-PT-1
Tran-Transl. Into English from Schweiz. Z. Fuer Hydrol. (Birkhaeuser), V. 34, No. 1, 1972 p 41-70.

Descriptors: *Drainage patterns, *Eutrophication, *Soil erosion, *Switzerland, Leaching, Nutrients, Topography.
Identifiers: Translations.

For abstract, see STAR 1321

ORNL-TM-4743 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
Reconnaissance Survey of the Intermediate Level Liquid Waste Transfer Line Between X-10 and the Hydrofracture Site.
J. O. Duguid, and O. M. Sealand. Aug 75, 24p
Contract W-7405-eng-26

Descriptors: (*Ornl, *Radioactive wastes), (*Soils, *Radioactivity), (*Ground water, Radioactivity), (*Radioactive waste storage, *Leaks), Antimony 125, Cesium 134, Cesium 137, Cobalt 60, Environmental effects, Niobium 95, Radiation monitoring, Ruthenium 106, Strontium 90, Zirconium 95.

For abstract, see NSA 32 08, number 19749.

ORNL-5057 PC$13.60/MF$2.25
Oak Ridge National Lab., Tenn.
Indexed Bibliography on Tritium: Its Sources and Projections, Behavior, Measurement and Monitoring Techniques, Health Physics Aspects, and Waste Management.
M. N. Dixon, C. F. Holoway, B. L. Houser, and D. G. Jacobs. Aug 75, 6p
Contract W-7405-eng-26

Descriptors: (*Tritium, *Bibliographies), Ecosystems, Environment, Food chains, Health hazards, Radiation monitoring, Radioactive effluents, Radioactive waste management, Radionuclide kinetics, Radionuclide migration.

For abstract, see NSA 32 08, number 19707.

PB-245 734/9GA PC$3.25/MF$2.25
Public Health Service, Denver, Colo. Colorado River Basin Water Quality Control Project.
State and County Area Tabulations for the Colorado River Basin.
Jan 62, 22p

Descriptors: *Watersheds, *Water pollution abatement, *Colorado River Basin, Drainage, Tables(Data), Statistical data, Economic factors.

The report provides drainage area determinations which have been adopted as standard basic data for use in the Colorado River Basin Water Quality Control Project. A check of available data of this type prepared by various public and private agencies revealed slight variations among the various sources. The data contained in this report were developed, therefore, to avoid confusion that might arise if a standard set of these data were not specified for use in this project.

RD/B/N-3337 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Modifications to the Cloud--Gamma Calculation in the Environmental Program Weerie.
J. O. Corbett. Mar 75, 14p
U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Gaseous wastes), (*Plumes, *Diffusion), (*Gamma sources, *Radiation doses), (*Computer codes, *W codes), Computer calculations, Environment, Radioactive clouds.

For abstract, see NSA 32 08, number 19745.

UCRL-76570(Rev.2) PC$5.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Role of Solubles and Particulates in Radionuclide Accumulation in the Oyster Crassostrea Gigas in the Discharge Canal of a Nuclear Power Plant.
F. L. Harrison, K. M. Wong, and R. E. Heft. 8 Aug 72, 39p CONF-750503-26

Descriptors: (*Bwr type reactors, *Radioactive waste disposal), (*Aquatic ecosystems, *Radionuclide migration), (*Oysters, *Radionuclide kinetics), (*Manganese 54, *Radioecological concentration), Aqueous solutions, Cesium 137, Cobalt 60, Liquid wastes, Particles, Solubility, Uptake, Zinc 65.

For abstract, see NSA 32 08, number 19759.

8I. Mining Engineering

IEA-27 PC$6.25/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
Application of Radioisotopes in the Petroleum, Gas, and Petrochemical Industries. Part I. Logging of Petroleum Wells (Natural gamma and gamma--Gamma Logging).
A. C. Castagnet, U. Duarte, T. Ohara, M. Said, and C. Szulak. Mar 74, 64p
In Portuguese. U.S. Sales Only.

Descriptors: (*Well logging, *Isotope applications), (*Petroleum, *Exploration), Gamma radiation, Petrochemicals, Porosity.

For abstract, see NSA 32 08, number 19861.

NVO-155(Vol.2) PC$19.75/MF$2.25
USAEC Nevada Operations Office, Las Vegas.
In Situ Leaching of a Nuclear Rubblized Copper Ore Body. Volume II.
Jun 75, 333p
Contract AT(26-1)-585

Descriptors: (*Copper ores, *In-situ processing), (*Nuclear explosions, *Uses), Feasibility studies, Fracturing, Leaching.

For abstract, see NSA 32 08, number 19673.

PAT-APPL-588 549/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Remote Sealing of Mine Passages Containing Flowing Water.
Patent Application,
Kenneth R. Maser. Filed 19 Jun 75, 9p
DOCKET/MIN-2298
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Sealing, *Patent applications, Tunneling(Excavation), Mines(Excavations), Passageways, Remote control, Fly ash, Aggregates, Seals(Stoppers), Barriers, Grouts, Cements, Grouting.

The patent application relates to underground passages having water flowing therein sealed remotely from the surface by first emplacing an aggregate layer on the passage floor through a borehole to a depth sufficient to allow the flowing water to percolate through the aggregate without overflowing it. Fly ash, either alone or admixed with cement or a swelling clay, is then pneumatically injected into the passage atop the aggregate. Finally, water flow is closed off by injecting a cementaceous grout into the aggregate layer.

PAT-APPL-604 566/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Method of Operating a Constant Depth Linear Cutting Head on a Retrofitted Continuous Mining Machine.
Patent Application,
Wallace W. Roepke, Kelly C. Strebig, and Bradley V. Johnson. Filed 14 Aug 75, 13p
DOCKET/MIN-2419
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Coal mining, *Mining equipment, *Patent applications, Underground mining, Shearing, Tunneling machines, Excavating equipment, Tunneling(Excavation), Linear systems, Cutters.
Identifiers: *Continuous mining, Continuous mining equipment.

The continuous mining machine of the patent application is moved to a position adjacent the mine face. Then beginning at the roof or floor of the mine face, the point attack bits are sumped into the face a given distance which is at least 3 inches. Next, without retracting the cutting bits from the face, the face is continuously sheared top to bottom or bottom to top across most of its full width in one pass and the material extracted is conveyed away from the face and mine machine. Normally, the sumping into the mine face is about 6 inches and the shearing substantially the total height and width of the mine face. After completing both steps, the machine is moved up to the mine face while the cutting bits are moved to the roof or floor, again sumped into the mine face, and then shearing takes place.

PB-245 085/6GA PC$7.50/MF$2.25
Barry (Theodore) and Associates, Los Angeles, Calif.
Operations Study of Selected Surface Coal Mining Systems in the United States.
Open file rept. (Final),
Feb 75, 236p* BuMines-OFR-72-75
Contract S0141048

Descriptors: *Coal mining, *Surface mining, *Strip mining, *Open pit mining, Operations research, Excavating equipment, Mine haulage, Stratigraphy, Production, Cost analysis, Reclamation, Systems analysis, United States.
Identifiers: Midwestern region(United States), Eastern region(United States), Northwestern region(United States), Southwestern region(United States).

This report discusses selected surface coal mining systems in the United States, and assesses the potential production and economic capacity of the systems. The study included four mines, using a different mining technique and different equipment. One mine was selected from each of the major coal fields: midwestern, eastern, northwestern, and southwestern. Following the documentation of each operation and development of a comprehensive production and cost data base, an analysis was conducted to identify production inefficiencies and to develop short-term and long-term improvements that would increase the mines' productivity or reduce costs.

PB-245 130/0GA MF$2.25
National Academy of Sciences-National Academy of Engineering, Washington, D.C. Environmental Studies Board.
Underground Disposal of Coal Mine Wastes.
Mar 75, 184p* ISBN-0-309-02324-6
Contract NSF-C310
Library of Congress Catalog Card no. 74-32597
Paper copy available from National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. 20418. PC$6.25.

Descriptors: *Solid waste disposal, *Coal mines, *Underground storage, Backfills, Spoil, Tailings, Earth fills, Cost estimates, Refuse disposal, Feasibility, Esthetics, Regulations, Safety, Groundwater, Water pollution.
Identifiers: Coal mine spoil, Mine wastes.

The report assesses the technological and economic feasibility of underground refuse disposal in the context of the full resource problem, considering the subsequent effect on the underground mining environment, costs and benefits as compared to other options, legal parameters, and related health factors. Considerations include safety of miners, groundwater contamination, backfilling methods, and losses in productivity. Existing legislation for coal mine waste disposal is reviewed. Tables and figures augment the text.

PB-245 193/8GA PC$4.25/MF$2.25
Bureau of Mines, Spokane, Wash. Spokane Mining, Research Center.
Ground Support Systems in Block-Cave Mining, A Survey.
Information circular 1974,
P. C. McWilliams, and A. E. Gooch. Aug 75, 52p BuMines-IC-8679

Descriptors: *Underground supporting, *Caving mining, Mining engineering, Cost effectiveness, Reviews.

Ground support problems were investigated in four major block-cave mines. This study provides a state-of-the-art look at ground support systems in today's block-cave mines. Further, areas for future research are delineated. In this regard, the most significant finding is the inability of present support systems to hold moving ground. As the mining progresses to greater depth, this problem becomes more serious. Providing adequate temporary capable of withstanding primary and secondary blasting is the next significant problem. A detailed analysis of the effect of mining methods on support problems is also recommended for future research.

PB-245 243/1GA PC$4.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Mineral Resources and Mining Planning Report.
Final rept.
Aug 75, 69p LISS-10
Report on Long Island Sound Study. Prepared in cooperation with Corps of Engineers, Washington, D.C. Prepared by Bureau of Mines, Pittsburgh, Pa. Eastern Field Operation Center.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Mineral deposits, *Sands, *Gravel, *Rocks, *Regional planning, *Long Island Sound, Demand(Economics), Supply(Economics), Land use, Transportation, Environmental impacts, Economic impact, Social effect, New York, Connecticut.

This planning report describes the mineral resources and mining element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 567/3GA PC$4.25/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Coal.
Project Proposal for Surface-Mined Land Enhancement (SMILE),
Arthur M. Hughes, and David R. Maneval. 29 Jan 75, 70p FEA/G-75/586
Prepared in cooperation with Appalachian Regional Commission, Washington, D.C.

Descriptors: *Strip mining, *Land reclamation, *Surface mining, Projects, Manpower, Requirements, Cost estimates, Pennsylvania, Ohio, Kentucky, Maryland, Alabama.
Identifiers: SMILE program.

This report outlines a program to reclaim 6,000 acres of the worst strip-mined land on public property in 5 states: Pennsylvania, Ohio, Maryland, Kentucky, and Alabama. The five basic goals of the project are: restore public lands which have been surface mined; demonstrate that surface-mined land can be restored in ways that preserve or enhance the environment; provide immediate employment; improve secondary employment opportunities and long-term economic prospects of reclaimed areas through construction of such land-utilization features as public forests, grazing lands, farm lands, parks, recreation and tourism opportunities; make possible improvements in national coal production.

8J. Physical Oceanography

AD-A015 988/9GA PC$3.25/MF$2.25
Woods Hole Oceanographic Institution Mass
Cruise Data Report R/V Chain Cruise 115 Leg 7.
Technical rept.,
J. D. Kroll, S. R. Gregg, and R. C. Groman. Jul 75, 20p Rept no. WHOI-75-35 NSF/IDOE-75-303
Contract N00014-74-C-0262, Grant NSF-GX-41960

Descriptors: *Oceanographic data, South Atlantic Ocean, Seismic reflection, Bathymetry, Geomagnetism, Magnetic anomalies, Gravity anomalies, Charts, Profiles, Navigation charts.
Identifiers: Bouguer gravity anomalies, Free air anomalies, Chain vessel, Recife(Brazil), Fortaleza(Brazil).

This report summarizes the geological and geophysical activities which were undertaken during Leg 7 of R/V CHAIN Cruise 115. A series of charts and profiles display the navigation, bathymetry, total field magnetic anomaly, free air and simple Bouguer anomalies, as well as all station locations.

AD-A016 243/8GA PC$3.75/MF$2.25
Naval Undersea Center San Diego Calif
Acoustic and Related Properties of the Sea Floor: Density and Porosity Profiles and Gradients.
Research and development rept., Feb 74-Jan 75,
Edwin L. Hamilton. Jul 75, 50p Rept no. NUC-TP-459

Descriptors: *Ocean bottom, *Underwater sound, *Sediments, Density, Porosity, Seismic reflection, Grain size, Acoustic velocity.

The general objectives of this investigation were (1) to determine and study those characteristics of the sea floor that affect the propagation of sound and the prediction of sonar performance; (2) to support underwater acoustic experiments and theory by furnishing information on the mass physical properties of sediments and rocks in the form of geoacoustic models of the sea floor; and (3) to develop models of the sea floor which include gradients of sound velocity and attenuation, density, and elastic properties. The specific objectives of this particular report were to determine and predict density profiles and gradients in common sediment and rock layers of the sea floor.

COM-75-11384/5GA PC$3.25
Rhode Island Univ., Kingston. Graduate School of Oceanography.
Sediment Resuspension and Deposition in Narragansett Bay,
C. A. Oviatt, and S. W. Nixon. 1975, 22p Marine Reprint-41 NOAA-75090805
Grant NOAA-04-3-158-3
Pub. in Estuarine and Coastal Marine Science, v3 n201-217 1975.

Descriptors: *Sedimentation, *Sediment transport, *Suspended sediments, *Narragansett Bay, Bed load, Surface waters, Deposits, Carbon compounds, Nitrogen, Organic compounds, Particle size, Silts, Rhode Island.
Identifiers: Reprints, Sea Grant program.

Monthly samples of sediments deposited in traps at three locations in Narragansett Bay Rhode Island, showed a gradient in sediment activity that increased from an annual mean of 20 + or - 8.8 g m squared/day at the head of the estuary to 51 + or - 16.7g/(m squared)/day at the mouth. Deposited materials were significantly higher in total organic matter, organic carbon and nitrogen than near surface sediments on the bottom. These parameters showed a gradient that decreased toward the mouth of the bay, with organic matter dropping from 14 + or - 1 to 10 + or - 1 % of the dry weight deposited; carbon from 5.4 + or - 0.9 to 3.4 + or - 1.0%; and nitrogen from 0.6 + or - 0.1 to 0.4 + or - 0.1%. The annual mean C/N ratio was 8.2 in the lower bay and 8.7 in the upper bay. Deposited materials were dominated by particles in the silt size range from 4-60 micrometers and comprised for the most part resuspended bottom sediments rather than fresh inputs of material from the water column.

COM-75-11385/2GA PC$4.75/MF$2.25
Virginia Inst. of Marine Science, Gloucester Point.
Bathymetric Comparisons: A Manual of Methodology, Error Criteria and Techniques,
A. H. Sallenger, Jr., V. Goldsmith, and C. H. Sutton. Jul 75, 81p VIMS-SRAMSOE-66 NOAA-75091707
Grant NOAA-04-5-158-49
Special rept. no. 66 in Applied Marine Science and Ocean Engineering.

Descriptors: *Bathymetry, *Oceanographic surveys, Accuracy, Errors, Correlation techniques, Depth finders, Sediments, Oceanographic charts, Submarine topography, Echo sounding, Ocean bottom, Contours, Grids(Coordinates).
Identifiers: Sea Grant program.

The paper is designed to provide useful methods by which bathymetric comparisons can be conducted to consider various aspects of accuracy criteria for soundings, and to discuss the use of methods and error criteria in specific applications. The study is subdivided into three basic sections. The first section (Methodology of Bathymetric Comparisons) discusses four methods by which charts can be compared and the limitations of each. The four methods are (1) data point comparison, (2) contour overlay method, (3) data point-grid point comparison, and (4) grid point comparison. The second section, entitled 'Error Criteria for Soundings' analyzes the two prime bathymetric data sources for the U.S. coastal waters (NOAA

and U.S. Army Corps of Engineers) in terms of the accuracy of soundings published by each source. The third section deals with sediment budget studies, analyses of mobility of subaqueous features, bathymetric stability for design criteria and mineral deposit exploration, and other applications of the techniques of bathymetric comparisons.

PB-245 408/0GA PC$6.25/MF$2.25
Woods Hole Oceanographic Institution, Mass.
The Continental Margin Off Western Africa: Angola to Sierra Leone.
Technical rept.,
K. O. Emery, Elazar Uchupi, Joseph Phillips, and Carl Bowin. Dec 74, 159p WHOI-74-99
NSF/IDOE-75-54
Grant NSF-GX-28193

Descriptors: *Marine geology, *Continental shelves, *Western Africa, Oceanographic surveys, Seismic reflection method, Seismic refraction, Geological sedimentation, Oceanographic ships, Geological faults, Geomagnetism, Geopotential, Mapping, Guinea Gulf, Coasts, Sierra Leone, Angola.
Identifiers: Atlantic 2 vessel, International Decade of Ocean Exploration.

The report describes the continental margin off Western Africa, from Angola to Sierra Leone. About 30,750 line km of geophysical traverses (seismic reflection and refraction, magnetics, and gravity) were made in the Gulf of Guinea and vicinity aboard R/V ATLANTIS II during 1972 and 1973 as part of the IDOE Program. These traverses, supplemented by about 50,000 line km of previous ones by other ships, provide a basis for mapping and understanding the geological structure, history and origin of the region. The deep indentation of the outline of western Africa is paralleled by a similar bend of the Mid-Atlantic Ridge, and by the prominent bulge of northeastern Brazil. These sharp bends are due to left-lateral offsets by numerous transform faults in a belt of equatorial fracture zones.

8K. Seismology

AD-A015 789/1GA PC$3.25/MF$2.25
Helsinki Univ (Finland) Inst of Seismology
Event Identification Capabilities of NORSAR,
Ilkka T. Noponen. 1975, 13p Rept no. Pub-144
AFOSR-TR-75-1409
Grant AF-AFOSR-2377-72, ARPA Order-2131
Availability: Pub. in Exploitation of Seismograph Networks, p397-407 1975.

Descriptors: *Seismic arrays, *Seismic waves, Norway, Earthquakes, Underground explosions, Detection, Spectrum analysis, Surface waves, Rayleigh waves, Short range(Time), Background, Discrimination, Seismic signatures, Classification, Pattern recognition, Finland, Reprints.
Identifiers: NORSAR(Norwegian Seismic Array), Norwegian seismic array, Primary waves.

The expected and observed shape of wave spectrum from earthquakes and underground explosions is discussed. The relative amplitudes of Rayleigh surface waves and P-waves are considered and the detectability of these waves from the noise at NORSAR is discussed. Explosion-generated P-wave signal power spectrum in the short period detection band 0.5 to 4 hz can often be reliably estimated even when the surface waves are unobservable. Attempts to use this frequency band for event classification are described. It is concluded that regional variation of seismic wave attenuation affects the observed values of the short period 'spectral' discriminants and that their classification capability is not yet proven. The predicted difference between the P-wave pulses radiated from underground explosions and earthquake sources suggests, however, that the short period P-waves in principle could be used for classifying small-magnitude events. (Author)

AD-A015 849/3GA PC$5.25/MF$2.25
Teledyne Geotech Garland Tex
Deep Borehole Operation of the Borehole Seismometer System, Model 36000.
Special technical rept. Aug-Jan 75,
E. J. Douze, and John R. Sherwin. 15 Mar 75, 105p Rept no. TR-75-2
Contract F08606-74-C-0013

Descriptors: *Seismographs, *Seismometers, *Boreholes, Operation, High temperature, High pressure, Reliability(Electronics), Test methods, Modification, Signal to noise ratio, Performance(Engineering), Wyoming.
Identifiers: *Seismic noise, Long period seismometers.

The project described was concerned primarily with, first, the modification of the Borehole Seismograph System, Model 36000, to operate under the high pressure and high temperature environment encountered in boreholes up to 3000 m (10,000 ft) deep, and secondly, various studies of signals and noise as a function of depth. Modification of the instrument, along with required auxiliary equipment was relatively straightforward and consisted primarily of substitution of high-reliability, 105C components for some of the standard units in the electronics sections. Actual operations were carried out at a deep borehole site near Pinedale, Wyoming during the period from April through December 1974. Data from three different long-period (LP) seismographs were recorded for analysis - a conventional surface LP system using 10 kg mass seismometers and galvanometer-phototube amplifiers, a standard Model 36000 at a fixed depth of 46 m (150 ft) and a deep-hole Model 36000 at various depths from 46 m to 914 m (3000 ft).

AD-A015 925/1GA PC$5.25/MF$2.25
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
Pattern Analysis and Classification with the New ACDA Seismic Signature Data Base.
Technical rept.,
C. H. Chen, and I. Chang Lin. 12 Aug 75, 110p
AFOSR-TR-75-1296
Grant AF-AFOSR-2119-71

Descriptors: *Pattern recognition, *Seismology, Earthquakes, Nuclear explosions, Data bases, Seismic detection, Spectrum signatures, Computer programs, Seismic detection, Signal processing.
Identifiers: *Seismic discrimination.

The new and expanded ACDA seismic data base makes it possible for meaningful comparison of different seismic recognition techniques based on the same data set. There are 157 earthquake and 157 explosion records in the data base. Pattern analysis in frequency domain as well as two-dimensional space is performed to seek for classification clues. Although useful structure of the seismic records is not available, the mathematical features provided by the autocorrelation function have 86.36% correct recognition on testing set by using 3 features (autocorrelation coefficients), 80 selected good quality training samples per class and the nearest-neighbor decision rule. All samples in the training set are identified correctly and thus the overall recognition rate of 93.00% is achieved. This result is better than the 89.2% recognition using dynamic spectral ratios (Table 7). The autocorrelation coefficients which are simple to calculate also perform better than the linear predictor (Markel) coefficients and other discriminants.

AD-A016 059/8GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Earthquake Engineering Research Lab
Near Field Small Earthquake Strong Motion Studies.
Final semi-annual technical rept., 1 Feb-31 Jul 75,
Mihailo D. Trifunac. 31 Jul 75, 22p AFOSR-TR-75-1365
Contract F44620-72-C-0097, ARPA Order-2134
See also report dated 31 Jul 74, AD-A000 570.

Descriptors: *Earthquakes, *Seismic detection, Faults(Geology), Power spectra, Tectonics, Ground motion, California, Discrimination, Near field.
Identifiers: San Andreas fault, *Seismic discrimination, Bear Valley.

The objective of the Joint Experiment on Earthquake Source Spectra is to improve ability to distinguish between the explosive and tectonic energy releases in the magnitude range 3 = or < M = or < 5. Recording the near-field strong ground motion will help in the more accurate determinations of the earthquake source time function and thus will improve the reliability of the near- and far-field spectra which are still the basic tools in detection work.

NTIS/PS-75/769/0GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Seismology (A Bibliography with Abstracts).
Rept. for 1974-Oct 75,
Audrey S. Hundemann. Oct 75, 185p*
Supersedes NTIS/PS-75/059.

Descriptors: *Bibliographies, *Seismology, Earthquakes, Earth movements, United States, Abstracts, Seismic waves.

Abstracts pertaining to seismic wave propagation, United States earthquakes, and analyses of strong motion earthquake accelerograms are presented. Excluded are abstracts on underground explosion detection. (Contains 180 abstracts).

N75-30706/6GA PC$3.25/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
A Comparison Between Mapping of Geological Discontinuities and Seismic Measurements.
E. Brueckl, and W. Fuerlinger. 1974, 14p CSIR-TRANS-1199
Tran-Transl. Into English from Z. Fuer Geophysik (West Germany), V. 39, 1973 p 291-302.

Descriptors: *Geological faults, *Mapping, *Rocks, *Seismology, Germany, Longitudinal waves, Seismic waves.
Identifiers: Translations.

For abstract, see STAR 1321

PB-245 187/0GA PC$3.25/MF$2.25
California State Dept. of Transportation, Sacramento. Transportation Lab.
Evaluation of the Point Mugu Earthquake of February 21, 1973.
Final rept.,
D. J. Kuhl. Jan 75, 19p CA-DOT-TL-2140-1-75-08

Descriptors: *Earthquakes, *Damage assessment, *Highways, Design, Predictions, Soil profiles, Seismic epicenter, Seismographs, Geological faults, Point Mugu, California.
Identifiers: Point Mugu earthquake, Ground motion, DOT/4CZ/CA.

The report presents a summary of damage caused by the February 21, 1973 earthquake

near Point Mugu, California to existing highway facilities in the area. Also presented are the results of a computer analysis of the ground motion and a prediction of the damage this earthquake would have caused at a proposed interchange between Routes 101/232/1 now under design.

UCRL-51830 PC$4.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Examination of the Geology and Seismology Associated with Area 410 at the Nevada Test Site.
W. J. Hannon, and H. L. McKague. 23 May 75, 35p
Contract W-7405-Eng-48

Descriptors: (*Nevada test site, *Geology), (*Earthquakes, *Forecasting), Seismology.

For abstract, see NSA 32 08, number 19771.

8L. Snow, Ice, and Permafrost

NTIS/PS-75/770/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Ice Fog (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
Robena J. Brown. Oct 75, 50p*

Descriptors: *Ice fog, *Bibliographies, Radio transmission, Millimeter waves, Weather modification, Fog dispersal, Arctic regions, Refractive index, Artificial precipitation, Silver compounds, Iodides, Landing fields, Super cooling, Aerosols, Alaska.

This bibliography of Federally-funded research reports includes citations relating to: Ice formation, modification, dispersal and forecasting. Problems of white outs and thermal pollution effects in Arctic regions are discussed. (Contains 45 abstracts).

8M. Soil Mechanics

AD-A015 738/8GA PC$3.75/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
An Electron-Optical Investigation of Soil Clay Minerals and Soil Stabilizing Agent Reactions.
Environmental research papers,
P. Michael Terlecky, Jr., Rossman F. Giese, Jr., James L. Eades, and Robert Wolfe. 14 Jul 75, 39p Rept nos. AFCRL-ERP-523, AFCRL-TR-75-0374

Descriptors: *Soil stabilization, *Clay minerals, *Soils, Calcium compounds, Calcite, Bearing strength, Crystal structure, Electron microscopy, Electronic scanners, X rays, Kaolinite, Montmorillonite, Expansion, Crystal lattices, X ray spectra, Surface roughness, Reactivities, Hydroxides, Carbonates, Moisture, X ray diffraction, Dispersing.
Identifiers: Illite, Calcium hydroxide, Expanding lattice clays, Swelling soils.

Characterization of reference clay mineral standards was accomplished by use of the scanning electron microscope (SEM), X-ray diffraction, and energy dispersive X-ray analysis. Experiments were conducted to determine the reactions between these clay minerals and lime which was used as a soil stabilizing agent. Examination of clay minerals visually by use of the SEM offers a partial examination of the irreactivity with soil stabilizing agents. Both surface area and surface roughness increase while there is an apparent decrease in the crystallinity of the clay minerals examined in the following order; Kaolinite group, Illite group, and Montmorillonite group. Reactions were studied of several soil clay minerals with various proportions of Ca(OH)2 and both with and without contact with the air. The major product of the reactions is calcite with smaller amounts of the material 3CaO . Al2O3 . CaCO3 . LIH2O. Scanning electron microscopy of the reacted materials shows a rough, 'corroded' surface on the clays as well as the formation of small single crystals of calcite and Ca(OH)2. Experimental studies showed that the problems of swelling soils can be alleviated by a double application Ca(OH)2 under proper moisture conditions. (Author)

N75-30392/5GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Determination of the Properties of Dielectric Layers on Dielectric Substrates by the Method of Radio Wave Ellipsometry.
S. Auer, and J. Schutt. Jun 75, 26p NASA-TM-X-70942, X-923-75-148

Descriptors: *Dielectric properties, *Ellipsometers, *Radio waves, *Soil mechanics, Mathematical models, Radar imagery, Remote sensors.

For abstract, see STAR 1321

PB-245 219/1GA PC$3.75/MF$2.25
Sydney Univ. (Australia). Civil Engineering Labs.
Use of a Phenomenological Model to Analyse Soil Creep.
Research rept.,
L. P. de Ambrosis, and H. G. Poulos. May 75, 46p R-263

Descriptors: *Soils, *Creep rate, *Foundations, Triaxial tests, Footings, Mathematical models, Soil properties, Creep strength, Strain, Settlement(Structural), Loads(Forces), Stresses, Correlation techniques, Australia.

A phenomenological model of soil behaviour is postulated which reproduces the commonly-observed characteristics of a linear creep strain versus log time relationship and which appears to fit the observed undrained and drained behaviour of soil in triaxial tests. The model is used in an approximate analysis of the complete time-settlement behaviour of a circular footing on a clay layer. Theoretical solutions are presented to illustrate the effects on footing behaviour of the soil parameters and the ratio of footing radius to layer depth. Comparisons are then made between the results of a series of model footing tests and the behaviour predicted by the theory and reasonable agreement is found.

8N. Terrestrial Magnetism

COM-75-50279-49/GA MF$2.25
World Data Center A for Solar-Terrestrial Physics, Boulder, Colo.
Catalog of Standard Geomagnetic Variation Data.
Aug 75, 136p UAG-49 NOAA-75091604
Paper copy available from National Climatic Center, Federal Bldg. Attn: Publications, Asheville, N.C. 28801. $25.20/year, $1.85 this issue.

Descriptors: *Geomagnetism, *Magnetic storms, *Magnetic surveys, Measurement, Indexes(Documentation), Statistical data, Tables(Data), Solar activity.

This catalog consolidates all of the geomagnetic variation data from standard and rapid-run measurements known to exist at World Data Center A for Solar-Terrestrial Physics. It includes data for time periods prior to the IGY, the earliest data set being for Batavia, Indonesia, 1867. The geomagnetic variation data in this catalog are held in the form of microfilm, magnetic tape, yearbooks and bulletins. They are in a variety of formats including magnetograms (normal, storm, and rapid-run), hourly values, 2.5 minute values, and various derived indices for individual observatories as well as for selected groupings of observatories. The data from about 300 observatories are referenced in this catalog, and a list of observatories along with their geographic and geomagnetic coordinates are presented. The main body of the catalog displays the years and months for which the World Data Center holds digital data, magnetograms, and K-indices for each observatory. Also presented is a catalog of derived geomagnetic indices, information on principal magnetic storms, and a catalog of available sets of magnetograms.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A015 751/1GA PC$4.75/MF$2.25
Rockwell International Corp Anaheim Calif Electronics Research Div
Investigation of SOS Processes for Fabrication of Radiation Hardened MIS Devices and Integrated Circuits.
Final rept. 1 May 74-31 May 75,
Ross A. Williams, Ranjeet K. Pancholy, and Donald K. Nichols. May 75, 81p Rept no. C74-829/501 AFCRL-TR-75-0320
Contract F19628-74-C-0199

Descriptors: *Integrated circuits, *Semiconductor devices, Silicon, Sapphire, Substrates, Radiation hardening, Radiation effects, Fabrication, Processing, Silicon dioxide, Metal oxide semiconductors.
Identifiers: Silicon on sapphire.

The program has the objectives of obtaining a better understanding of the radiation-induced n-channel SOS leakage problem and of examining the effects of processing variations on the radiation-induced leakage. Experiments were performed on devices from 6 processing lots--encompassing variations in silicon doping densities and techniques, device design, and device geometry. Experiments on devices having the sapphire thinned to approximately 3 mils and with a gate electrode on the sapphire demonstrated that the radiation-electrode n-channel leakage is due to inversion of the p-type silicon at the sapphire interface by positive charge trapped in the sapphire. This charge was found to saturate at a value of approximately 3 x 10 to the 11th power charges/sq cm, under conditions of +10 V drain bias during irradiation.

AD-A015 767/7GA PC$4.25/MF$2.25
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
Radiation Effect on GaAs Interface.
Final rept. Feb 74-Aug 75,
Rainer Zuleeg, and Kurt Lehovec. May 75, 70p AFCRL-TR-75-0304
Contract F19628-74-C-0129
See also AD-A004 171.

Descriptors: *Gallium arsenides, *Field effect transistors, *Radiation effects, Semiconducting films, Epitaxial growth, Vapor deposition, Neutron irradiation, Gamma rays, Ionizing radiation, Interfaces, Electron mobility, Charge carriers, Doping, Chromium, Mathematical models, Junction transistors.

The C-V and Q-V technique was applied to the study of interface charge distributions of GaAs epitaxial layers grown on semi-insulating sub-

strates. Changes of mobility and free carrier concentration in the epitaxial layer and extending through the interface into the substrate were determined before and after exposure to a neutron fluence of 2.7 x 10 to the 15th power n/sq cm and a total dose of ionizing radiation of 10 to the 8th power rad (GaAs). Changes at the interface and in the epitaxial layer are correlated with the voltage-current characteristic variations of the GaAs junction field-effect transistors.

AD-A015 809/7GA PC$3.75/MF$2.25
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Reflectivity of Interdigitally and Face-to-Face Poled Surface Acoustic Waves Transducers.
Master's thesis,
James Thomas Pye. Jul 75, 46p Rept nos. R-684, UILU-ENG-75-2219
Contract DAAB07-72-C-0259

Descriptors: *Transducers, Acoustic waves, Surface waves, Reflectivity, Theses.
Identifiers: Acoustic surface waves, Interdigital transducers.

Methods of measuring and modulating the reflectivity interdigital transducers are investigated through a DC field applied to the transducer, varying the electrical termination of the transducer, and removing the aluminum pattern on the substrate.

AD-A016 050/7GA PC$4.75/MF$2.25
Westinghouse Research Labs Pittsburgh Pa
Superconducting Windings.
Final rept.,
M. S. Walker, and J. H. Murphy. Sep 75, 83p
Rept no. 75-9C31-CRYEL-R2
Contract N00014-73-C-0461
See also report dated Feb 75, AD-A006 476.

Descriptors: *Magnet coils, *Superconductors, Mathematical models, Losses, Magnetic fields, Marine propulsion, Electric generators.
Identifiers: Superconducting windings.

The report summarizes the results of an approximately 20 man month experimental and theoretical effort which has culminated with the construction of a mathematical model for the calculation or estimation of losses in multifilament superconductors. The model treats the practical case of ramped or transient magnetic fields transverse to conductor elements of circular or rectangular cross section and carrying fixed or changing transport currents which may or may not be related to field changes. The model, which has not been completely verified experimentally and in many instances points the way for further work, is presented complete with background, justification, qualifications, and example calculations. Experimental accomplishments, mainly calorimetric loss measurements, and theoretical accomplishments are summarized in part through a presentation of abstracts with references to relevant publications or to as yet unpublished results some of which are presented in the appendices.

AD-A016 159/6GA PC$4.25/MF$2.25
Hughes Aircraft Co Fullerton Calif Ground Systems Group
Acoustic Velocity Correlator.
Final rept. 1 Sep 73-31 Aug 74,
R. C. Knittle, and T. W. Bristol. Aug 75, 58p Rept no. FR-75-14-522 ECOM-0121-F-72
Contract DAAB07-72-C-0121
See also report dated Jun 74, AD-782 232.

Descriptors: *Correlators, Acoustic delay lines, Surface waves, Acoustic waves, Acoustic velocity, Transducers, Signal processing, Photolithography, Doppler effect, Arrays.
Identifiers: Acoustic surface waves.

The program has demonstrated the feasibility of implementing a 16 input x 16 output channel velocity correlator network of a Pulse Burst Processor System using acoustic surface waves. The acoustic velocity correlator is a network of multiple tapped delay lines which corrects the Doppler time shifts of the output signals from a pulse burst tapped delay line and sums the corrected signals in a single Doppler velocity channel. A 50 MHz bandwidth, 8 x 9 channel prototype device was developed on this program which demonstrates the feasibility of implementing a 16 x 16 channel velocity correlator. One of the most important achievements of this program was the development of a technique to fabricate high frequency surface wave transducers by direct projection of oversized patterns onto a substrate over a 1 in x 1 in area. This report describes the design, fabrication, and testing of the 8 x 9 channel prototype device.

AD-A016 162/0GA PC$3.75/MF$2.25
Monsanto Research Corp Dayton Ohio Dayton Lab
Planar High Energy Permanent Magnets.
Final rept. 1 Mar 73-31 Mar 75,
M. C. Willson, and R. J. Janowiecki. Jul 75, 47p
Rept no. MRC-DA-500 ECOM-73-0112-F
Contract DAAB07-73-C-0112
See also report dated Dec 73, AD-771 956.

Descriptors: *Permanent magnets, Cobalt compounds, Samarium compounds, Plasma spraying, Magnets, Fabrication, Electron tube parts, Traveling wave tubes, Crossed field devices, Planar structures, High energy.
Identifiers: Samarium intermetallics, Cobalt intermetallics.

Samarium-cobalt permanent magnets were fabricated by arc plasma spraying in order to evaluate this technique as an economical method for fabricating cobalt-rare earth magnets for advanced traveling wave tubes and crossfield amplifiers. Bar magnets were produced having a coercive force of 6100 oersteds and an energy product of 10.8 million gauss-oersted. The magnetic properties in bar magnets were significantly better in the direction parallel to the spray direction. SmCo5 bar magnets were directly bonded to magnesia-excess spinel substrates and showed no evidence of cracking or warping in the magnet-substrate assembly even after heat treatment. Two 52-bar magnet assemblies were constructed, each consisting of two 26-bar arrays, 1 inch x 8 inch. The bar magnets were magnetized so as to achieve peak axial field strengths of 450 to 500 gauss with a period of 0.6 inch in each assembly.

AD-A016 257/8GA PC$4.75/MF$2.25
Northrop Research and Technology Center Hawthorne Calif
Plasma Electron Gun.
Final rept. 26 Dec 73-25 Feb 75,
Benedict B. O'Brien, Jr., D. B. Cohn, and J. E. Thompson. 1975, 84p Rept no. NRTC-75-19R
Contract DAAH01-74-C-0350

Descriptors: *Electron guns, *Diodes, *Gas lasers, Plasma devices, Lasers, Pulses, Electric discharges, Gas discharges.
Identifiers: *Plasma diodes.

A significant degree of control over the electrical energy deposition in high pressure gas electric discharge laser media can be realized when the source of ionization is separated from the main source of pumping energy. The most effective external source of ionization offering the widest parametric latitude is a beam of high energy electrons. Since creation of the electron beam takes place in an environment far different from that in the laser cavity, an electron transmitting window, usually a thin metal foil, is required to separate these two regions. These foils, represent a common limitation to overall system reliability. The electron source described in this report makes use of a secondary emission from a cold cathode in a low pressure discharge and is capable of high current densities (about 0.5 A/sq cm) for durations on the order of 20 microseconds. The objective of this program was to characterize the plasma diode electron gun in detail and to apply this data to the conceptual design of large area devices.

AD-A016 280/0GA PC$3.75/MF$2.25
Texas Univ At Austin Plasma Physics Lab
Evaluation of Noise Suppressing Transmission Lines,
C. R. Skipping, and M. E. Oakes. Jan 75, 35p
Contract DAEA18-74-C-0224

Descriptors: *Transmission lines, Noise(Electrical and electromagnetic), Suppression, Electrical networks, Integral equations, Difference equations, Numerical integration, Intermodulation.
Identifiers: Network analysis theory.

Modeling the behavior of transmission lines and wave filters and the theory of wave propagation in solids involves extensive study of waves supported by iterative networks or lattice structures. It can be shown that for a given frequency, the iterative circuit diagrammed in Figure 1 supports two models of oscillation. Furthermore, in such a structure where the capacitances vary with the nodal index n, there can be regions where either mode reflects and linearly converts to the other. Figure 2 shows the dispersion relation for a case analogous to what can be encountered in geometrical optics. That is, a case where a slow linear variation in the capacitances has been put into the dispersion relation obtained for a uniform lattice. A thorough analytic treatment of a bimodal LC lattice structure for both uniform and nonuniform cases was carried out. The results aid significantly in clarifying and giving direction to the task of computer evaluations.

AD-A016 285/9GA PC$5.25/MF$2.25
Raytheon Co Waltham Mass Research Div
Distributed Ferrite Isolation in Traveling-Wave Tubes.
Annual status rept. Jun 74-Jul 75,
John Osepchuk, and Daniel Masse. 2 Sep 75, 118p
Contract N00014-74-C-0322

Descriptors: *Traveling wave tubes, *Ferrites, Isolation, Electron tube parts, Microwave tubes, L band, Modes, Coupling(Interaction).

The report describes the status after one year of a program to introduce distributed ferrite isolation in a high power CW traveling-wave tube of broad bandwidth >1 octave. Cold tests indicate feasibility of over 50 dB reverse loss and only 5 dB forward loss. The best results occur when there is coupling to broadband edge modes of ferrite slabs. Evidence of coupling to the lower branch of edge mode, i.e., magnetostatic, has been obtained with L-band helix. Cold tests and analysis suggest coupling to ferrite edge modes from helix is easier at higher microwave frequencies. Plans for a hot test at the 1-2 kW power level is an L-band TWT incorporating such distributed ferrites are described.

BNL-19839 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Dielectric Design Considerations for a Flexible Superconducting Power Transmission Cable.
E. B. Forsyth, A. J. McNerney, and A. C. Muller. 1975, 11p CONF-750716-4

Descriptors: (*Superconducting cables, *Electrical insulation), (*Dielectric materials,

*Performance), (*Power transmission lines, Superconducting cables), Mechanical properties.

For abstract, see NSA 32 08, number 19578.

BNL-19849 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Considerations of Voltage Drop and Losses in the Design of Helically-Wound Superconducting AC Power Transmission Cables.
G. Morgan, and E. B. Forsyth. 1975, 15p CONF-750716-3

Descriptors: (*Superconducting cables, *Ac losses), (*Power transmission lines, Superconducting cables), Alternating current, Flexibility, Helical configuration, Stresses.

For abstract, see NSA 32 08, number 19579.

LA-UR-75-1099 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Evaluation of Pre-Impregnated Resin-Glass Systems for Insulating Superconducting Magnets.
R. I. Schermer. 1975, 14p CONF-750716-6
Contract W-7405-ENG-36

Descriptors: (*Superconducting magnets, Electrical insulation), (*Electrical insulation, *Fabrication), Composite materials, Glass, Mechanical properties, Resins.

For abstract, see NSA 32 08, number 19583.

N75-30394/1GA PC$3.25/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
Plan for the Protection of Ehv Networks at the 1975 Technical Level.
P. Deletang. 1975, 19p CSIR-TRANS-1206
Tran-Transl. Into English from Rev. Gen. Elec. (Paris), V. 83, No. 2, 1974 p 83-88. Conf-Presented at Session 15 of the French Soc. Of Elec., Electron., and Radioelectrical Engr., 25 Jun. 1973.

Descriptors: *Electrical insulation, *Short circuits, Bus conductors, Electrical faults, Transformers, Transmission lines.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30435/2GA PC$5.25/MF$2.25
Sedco Systems, Inc., Farmingdale, N.Y.
High Power Ferrite Microwave Switch.
I. Bardash, and N. K. Roschak. 1975, 102p
NASA-CR-134774
Contract NAS3-16752

Descriptors: *Aerospace environments, *Ferrites, *Microwave switching, Logic circuits, Microwave transmission, Performance prediction, Phase shift, Product development.

For abstract, see STAR 1321

N75-30440/2GA PC$4.25/MF$2.25
RCA Research Labs., Montreal (Quebec).
Lithium Drifted Germanium System.
Final Report.
E. J. Fjarlie. Sep 69, 62p NASA-CR-144407, RES-96151-1
Contract NAS9-9377

Descriptors: *Germanium diodes, *Lithium, *Photodiodes, Cryogenic equipment, Equipment specifications, Operational problems, Preamplifiers.

For abstract, see STAR 1321

N75-30895/7GA PC$3.75
Universite des Sciences et Techniques de Lille (France). Centre de Recherches Hyperfrequences et Semiconducteurs.
Avalanche Diode Frequency Multiplication. Comparison of Si and GAAS Possibilities. Improvement of Performance in the 26-40 Ghz Range and Extension in the 60-90 Ghz Range Multiplication de Frequence a Diode Avalanche. Comparaison des Possibilites du Si et du GAAS. Amelioration des Performances dans la Bande des 20-40 Ghz et Extension dans la Bande des 60-90 Ghz.
Final Report.
E. Constant, G. Salmer, P. A. Rolland, and A. Derycke. Aug 74, 35p
Contract DGRST-72-7-0513
Language in French.

Descriptors: *Avalanche diodes, *Extremely high frequencies, *Frequency multipliers, *Gallium arsenides, *Silicon, Epitaxy, Frequency stability, Optimization, Performance tests, Signal to noise ratios, Technology assessment.

For abstract, see STAR 1321

N75-30896/5GA PC$3.25
Paris Univ. (France). Lab. de Physique des Solides.
A Thermal Diffusion of Interstitial Impurities in Diamond-Type Lattices Etude de la Diffusion Athermique d'Impurettes Interstitielles dans les Reseaux de Type Diamant.
J. C. Bourgoin. Aug 74, 10p
Contract DGRST-73-7-1650
In French; English Summary.

Descriptors: *Diffusion coefficient, *Interstitials, *Schottky diodes, *Thermal diffusion, Carrier injection, Electron irradiation, Gold, Ion production rates, Silicon, X ray irradiation.

For abstract, see STAR 1321

PAT-APPL-482 393/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Electronic Solid State Sensor Image Size Control.
Patent Application,
Edward A. Petrocelli, and Anthony C. H. Louis. Filed 24 Jun 74, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Images, *Optical detectors, Patents, Solid state electronics, Control, Electrooptics, Semiconductor devices.
Identifiers: *Patent applications, PAT-CL-178-7-3-D.

The patent application describes an electronic control system for changing the image size produced by solid state sensors such as the Reticon sensor array, charged coupled devices, etc. The image size is increased or decreased by varying the horizontal and vertical scanning rate with respect to standard TV timing. The scanning rate is controlled by controlling the frequency of the horizontal and vertical clock pulses applied to the solid state sensor.

PAT-APPL-533 116/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Laser Activated Superconducting Switch.
Patent Application,
Alfred A. Wolf. Filed 16 Dec 74, 20p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electronic switches, *Superconductors, *Optoelectronics, Lasers, Bistable devices, Patents.
Identifiers: *Patent applications, PAT-CL-338-32-S.

The patent application relates to a superconducting switch or bistable device comprising a superconductor in a cryogen maintaining a temperature just below the transition temperature, having a window of the proper optical frequency band for passing a laser beam which may impinge on the superconductor when desired. The frequency of the laser is equal to or greater than the optical absorption frequency of the superconducting material and consistent with the ratio of gap energy of the switch material to Planck's constant to cause depairing of electrons and thereby normalizing the superconductor. Some embodiments comprise first and second superconducting metals. Other embodiments feature the two superconducting metals separated by a thin film insulator through which the superconducting electrons tunnel during superconductivity.

PAT-APPL-562 381/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Apparatus for Insulating Stator Coils.
Patent Application,
George E. S. King. Filed 26 Mar 75, 11p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Molds(Forms), *Electrical insulation, Patents, Electric coils, Electric motors, Silicones, Synthetic rubber, Molding techniques.
Identifiers: *Patent applications, PAT-CL-29-596.

The patent application describes an apparatus for producing a replicate, void free, impermeable, symmetrical electrical insulation barrier for stator motor coils is described wherein a silicone rubber compound is employed as an insulator around the preformed stator coils in a copper-beryllium mold. The coil insulation is cured at a predetermined temperature after being subjected to pressure in the mold.

PAT-APPL-582 005/GA PC$3.75/MF$2.25
Department of the Interior, Washington, D.C.
Method and Apparatus for a Power Circuit Breaker Controller.
Patent Application,
Harold C. Ramberg, and Alvin C. Legate. Filed 29 May 75, 33p DOCKET/BPA-2314
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electric controllers, *Patent applications, Circuit breakers, Surges, Suppressors, High voltage, Power transmission lines, Electric switches.

The primary object of the patent application is a method for closing a high voltage circuit breaker. Another object is the apparatus for operating the closure of a high voltage circuit breaker to minimize line voltage surges according to the method claimed.

PAT-APPL-586 113/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Improved Millimeter Waveguide to Microstrip Transition.
Patent Application,
David J. Saul. Filed 11 Jun 75, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Waveguide couplers, Patents, Waveguides, Strip transmission lines, Transitions, Modes, Filters, Electric connectors, Broadband.
Identifiers: *Patent applications, PAT-CL-333-70.

The patent application relates to a waveguide to microstrip transition apparatus in which a waveguide coupled to a microstrip circuit is provided with a mode filter for suppressing

spurious modes of electromagnetic signal propagation. The mode filter is attached to the end of the waveguide that is coupled to the microstrip circuit and the mode filter extends over a portion of the microstrip circuit.

PAT-APPL-587 445/GA PC$3.25/MF$2.25
Department of the Navy Washington D C.
In-Line Waveguide to Coax Transition.
Patent Application,
John Reindel. Filed 16 Jun 75, 6p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Waveguide couplers, Patents, Transitions, Waveguides, Coaxial cables, Strip transmission lines, Electric connectors.
Identifiers: *Patent applications, PAT-CL-333-33.

The patent application describes a transition apparatus for changing from a waveguide to a coaxial connector. A tapered or stepped ridge waveguide section is electrically connected to a section of microstrip which is electrically connected to a coaxial connector, the coaxial connector being in line with the waveguide.

PATENT-3 902 143 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
Refrigerated Coaxial Coupling.
Patent.
E. R. Wiebe, and R. C. Clauss. Patented 26 Aug 75, 7p PAT-APPL-483 852
Misc-Filed 27 Jun. 1974 Supersedes N74-2789 (12 - 17, p 2014). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Coaxial cables, *Cooling systems, *Couplings, *Microwave equipment, Beam waveguides, Masers, *Patents, Refrigerating, Vacuum tubes.
Identifiers: PAT-CL-333-21-R.

A transmission line for improving the sensitivity of a maser or other microwave processing equipment by using a cooled coaxial line for coupling a waveguide to a refrigerated maser, is discribed. The central coaxial conductor has an outer end projecting into the waveguide and covered by a quartz dome. The space between the central and outer conductors of the coaxial line is evacuated to minimize heat transfer, the central coaxial conductor is supported by the outer conductor at its inner end which is refrigerated to less than 5 Kelvin, and the central coaxial conductor is a short solid 9copper rod to maintain the outer end at a low temperature.

SAND-75-0103 PC$4.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Low Voltage Initiation of Damaging Arcs Between Electrical Contacts.
R. E. Cuthrell. Jul 75, 27p
Contract AT(29-1)-789

Descriptors: (*Gold, *Erosion), (*Copper, Erosion), (*Electric contacts, *Electric arcs), Electric potential, Electrodes, Melting.

For abstract, see NSA 32 08, number 20268.

9B. Computers

AD-A015 689/3GA PC$3.75/MF$2.25
Yale Univ New Haven Conn Dept of Computer Science
SAM: A Story Understander.
Technical rept.,
Roger C. Schank. Aug 75, 47p Rept no. RR-43
Contract N00014-75-C-1111

Descriptors: *Artificial intelligence, *Computer applications, Semantics, Mathematical logic, Natural language, Computer programming.
Identifiers: Parsing, MARGIE system, Question answering systems, *SAM computer program, *SAM(Script Applier Mechanism), Script applier mechanism.

A program is described that understands stories. The program can answer questions about stories it has read as well as paraphrase them, translate them into Chinese, and summarize them.

AD-A015 741/2GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
A User's Guide to the MX Crew Ratio Simulation Model.
Interim rept. 1 Nov 74-30 Apr 75,
Raul Garcia, Paul A. Lozano, and Joseph E. Braswell. Aug 75, 22p Rept no. SAM-TR-75-34

Descriptors: *Computer programs, *Flight crews, *Computerized simulation, *Supersonic transports, *Mathematical models, Ratios, Guided missile launchers, Air to surface missiles, Flying platforms, Air launched, User needs, Computer logic, Optimization, Utilization, Systems analysis.
Identifiers: *C-5A aircraft, *MX crew simulation model, C-5 aircraft.

The structure and products of the MX Crew Ratio Simulation Model are explained in general terms. This report is intended for persons who need to be familiar with the capabilities of the model but who have no need to know the detailed program logic. An example is also presented of some initial results using the model. (Author)

AD-A015 748/7GA PC$7.25/MF$2.25
Michigan Univ Ann Arbor
User Requirements Language (URL) Users Manual.
Technical rept.,
Henry J. Eiden, and Charles R. Moore. Mar 75, 216p ESD-TR-75-88-Vol-2
Contract F19628-74-C-0171

Descriptors: *Programming languages, *Computer programs, *Computer applications, Syntax, Natural language, Grammars, Data storage systems, Specifications, Interfaces, User needs, Requirements.

The User Requirements Language (URL) is one of two major components of computer aided requirements analysis. URL is a machine processable language that appears very much like English. Its precision facilitates machine storage of requirements data while its natural language appearance facilitates use by non-computer experts. The language provides a medium within which functional and performance requirements of information systems can be expressed in a standard way, more easily analyzed, and compared between systems. URL is meant to be used conjunction with the User Requirements Analyzer described in ESD-TR-75-88, Vol. 3. (Author)

AD-A015 753/7GA PC$4.25/MF$2.25
Defense Supply Agency Alexandria Va Office of the Assistant Director Plans Programs and Systems
Report on Logistics Computers Power Supply.
Apr 75, 68p

Descriptors: *Power supplies, Data processing equipment, Computers, Military equipment, Logistics, Reliability(Electronics), Power, Flux(Rate), Losses, Downtime.

A study of the electric power being provided to logistics systems computers was made to determine the impact of power fluctuations and power outages on these computer systems. The report contains analyses performed using data pertaining to the power supplies of computers supporting the logistics systems of the Military Services and the Defense Supply Agency. The data used for the analyses was obtained through DoD Component briefings, Component data submissions, and on-site research. Conclusions and recommendations based on these analyses are included in the Report.

AD-A015 762/8GA PC$3.25/MF$2.25
Inco Inc Mclean Va
TOSS Common User Capability.
Final technical rept.,
Lelia Irby, Leon Marcus, Marianne Russek, and Karen Hsing. Jul 75, 24p RADC-TR-75-186
Contract F30602-74-C-0116

Descriptors: *Data processing terminals, *Communications networks, *Intelligence, *Information systems, Data bases, Data management, Computer programming, Interfaces, On line systems.
Identifiers: *Data base management systems, *TOSS(Terminal Oriented Support System), Terminal oriented support system, Operating system(Computers), AN/GYQ-21(V).

The TOSS Common User Capability addresses the need to make user communication with large structured files of data as simple and logical as possible by providing interactive interface between the TOSS Information Management System (TIMS) and a user who is more familiar with his data base than he is with the mechanics of programming and file manipulation. The specific areas of data base management incorporated in the TOSS Common User Capability are file data definition, updating a data base, querying a data base, and generating formatted reports of file data. User language access to data management functions is primarily in the form of a simple dialogue conducted at his terminal, in which the user's commands and responses are prompted by the system.

AD-A015 763/6GA PC$5.25/MF$2.25
Pattern Analysis and Recognition Corp Rome N Y
Structured Programming Evaluation.
Final technical rept.,
J. M. Morris, K. N. Klingbail, P. Kane, A. Franklin, and R. Jackson. Jul 75, 125p Rept no. PAR-74-25 RADC-TR-75-179
Contract F30602-73-C-0351

Descriptors: *Computer programming, Compilers, Reliability, Algorithms.
Identifiers: *Structured programming, *Computer program reliability, Honeywell 6180 computers, MULTICS system, PL/1 programming language.

This report was prepared as part of a structured programming effort. The first section provides a general introduction to structured programming concepts. It is intended to give some of the background material needed to place the project in an appropriate perspective. The second section describes the Structured Programming Preprocessor (SP3), which performs certain editing, precompiling and diagnostic functions in support of structured programming the PL1 language under the MULTICS Operating System. The third section provides a systemmatic study of programming experience under the constraints of structured programming. Conclusions and recommendations are presented in the fourth section.

AD-A015 794/1GA PC$3.75/MF$2.25
IBM Federal Systems Center Gaithersburg Md
Structured Programming Series. Volume IV. Data Structuring Study.
Final technical rept.,

John T. Trimble. 21 Apr 75, 49p RADC-TR-74-300
Contract F30602-74-C-0186
See also Volume 3, AD-A013 255.

Descriptors: *Computer programming, Data processing.
Identifiers: *Structured programming, Data structures.

This report contains the results of a survey of the technical literature in the area of data definition, data flow, and data handling together with descriptions of techniques and mechanisms for resolving some of the problems in these areas. The techniques and mechanisms described are fully compatible with top down structured programming and can be used in conjunction with the Programming Support Library, described in Volume V and VI of the Structured Programming Series.

AD-A015 795/8GA PC$3.75/MF$2.25
IBM Federal Systems Center Gaithersburg Md
Structured Programming Series. Volume XIV. Software Tool Impact.
Final rept.,
Marvin M. Kessler, and William E. Kister. 22 May 75, 32p RADC-TR-74-300-Vol-14
Contract F30602-74-C-0186
See also Volume 10, AD-A008 861.

Descriptors: *Computer programming, *Compilers, Syntax, On line systems.
Identifiers: *Structured programming, COBOL.

This report contains an assessment of the impact of a structured programming precompiler on software tools used in support of a programming project. Use of the precompiler in both the program development and program operational phases is addressed. A projection of how structured programming will affect future software tool development is also included.

AD-A015 799/0GA PC$3.25/MF$2.25
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
On the Use of Distance and Information Measures in Pattern Recognition and Applications.
Technical rept.,
C. H. Chen. 1 Aug 75, 20p Rept no. EE-75-5
AFOSR-TR-75-1237

Descriptors: *Pattern recognition, Measure theory, Sampling, Probability density functions, Bayes theorem.
Identifiers: Feature selection, Parameter estimation.

In the development of pattern recognition theory during the past few years, there has been active interest in comparing the relative merits of various distance and information measures by evaluating the error bounds. Normally the tighter the error bounds a distance or information measure can provide, the better features it can select. There are now at least fifteen different measures available. They have two main advantages. (1) They are generally easier to calculate than the error probability itself which normally cannot be computed exactly. These measures can provide good upper and/or lower bounds of the error probability. (2) Features can be selected and ordered to maximize (or in some cases minimize) the measures in order to minimize indirectly the error probability. Linear transformation for dimensionality reduction can also be derived from these measures. This paper is concerned with the theoretical problems and the applications of these measures.

AD-A015 842/8GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Path Expressions.
A. N. Habermann. Jun 75, 38p AFOSR-TR-75-1292
Contract F44620-73-C0074, Grant NSF-DRC74-24573

Descriptors: *Computer programming, Compilers, Network flows, Instruction manuals.
Identifiers: Operating systems(Computers), Graph theory.

Traditionally, synchronization of concurrent processes is coded in line by operations on semaphores or similar objects. Path expressions move the responsibility of implementing such restrictions from the programmer to a compiler. The programmer specifies as part of a type definition which execution sequences are permitted. The advantage of using path experssions instead of P,V operations on semaphores (or similar operations) is comparable to the advantage of using for- and while-statements instead of JUMP or BRANCH instructions. In this paper the rules for writing a path expression are described, parsing and implementation are discussed and the use of path expressions is shown by a number of examples.

AD-A015 843/6GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Program Design With Abstract Data Types.
Interim rept.,
Lawrence Flon. Jun 75, 37p AFOSR-TR-75-1295
Contract F44620-73-C-0074, ARPA Order-2466

Descriptors: *Computer programming, Compilers, Recursive functions, Algorithms.
Identifiers: Logic design, Structured programming, Operating systems(Computers).

This paper explores the use of abstract data types as a modularization and structuring technique in the design of programs, particularly larger programs including compilers and operating systems. The concepts of type and type definition are discussed. Some data structuring mechanisms are generalized and several simple examples are presented. The examples increase in complexity and conclude with the design of a directory system, illustrating the power of data types as a design tool.

AD-A015 845/1GA PC$7.00/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Multiprocess Software Architecture for AI Problem Solving,
Richard Dean Fennell. May 75, 199p AFOSR-TR-75-1313
Contract F44620-73-C-0074

Descriptors: *Multiprocessors, *Computer programming, *Artificial intelligence, Problem solving, Computer architecture, Parallel processing, Scheduling, Time sharing, Data bases, Speech recognition, Theses.

This dissertation describes the design and development of a knowledge-based artificial intelligence problem-solving organization that is suitable for efficient implementation on a closely-coupled multiprocessor computer system. The method is a result of formulating the problem-solving organization in terms of the hypothesize-and-test paradigm for heuristic search, with communication between the various hypothesizers and testers being effected by writing intermediate results in a shared blackboard-like data base. These hypothesizers and testers are expressed in terms of knowledge sources which represent bodies of suitably ortanized subject-matter knowledge pertinent to the task domain of the problem being solved. The various system organization problems connected with such a multiprocessing scheme are discussed, and solutions to these problems are presented. The major contributions of this work lie in the analysis and solution of the various multiprocessing problems that have arisen in the course of specifying this problem-solving organization.

AD-A015 846/9GA PC$3.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
A Complete Unification Algorithm for Associative-Commutative Functions,
Mark E. Stickel. Jun 75, 20p AFOSR-TR-75-1291
Contract F44620-73-C-0074, Grant NSF-GJ-28457

Descriptors: *Computer programming, *Mathematical logic, Algorithms, Theorems.
Identifiers: *Theorem proving, Axioms.

An important component of mechanical theorem proving systems are unification algorithms which find most general substitutions which, when applied to two expressions, make them equivalent. Functions which are associative and commutative (such as the arithmetic addition and multiplication functions) are often the subject of mechanical theorem proving. An algorithm which unifies terms whose function is associative and commutative is presented here. The algorithm eliminates the need for axiomatizing the associativity and commutativity properties and returns a complete set of unifiers without recourse to the indefinite generation of variants and instances of the terms unified required by previous solutions to the problem.

AD-A015 853/5GA PC$3.25/MF$2.25
University of Southern California Los Angeles Dept of Aerospace Engineering
A Hybrid Computer Optimal Filter,
L. Basanez, P. Brunet, R. S. Bucy, R. Huber, and D. S. Miller. 1975, 7p
Grants AF-AFOSR-2141-71, NSF-OIP74-20601

Descriptors: *Hybrid computers, Parallel processing, Algorithms, Bayes theorem, Computer architecture, Nonlinear systems.
Identifiers: *Nonlinear filtering.

In 1971 a hybrid computer algorithm for implementation of an optimal nonlinear one-step predictor by applying Bayes' Rule to sequentially update the conditional probability density function from the latest data was presented in a paper. Such a filter has been constructed at the Laboratorio de Automatica at the Universidad Politecnica de Barcelona. This paper contains a description of the hybrid optimal filter as it was actually implemented for the cubed sensor problem. A comparison of the hardware and software architectural features with those proposed in the 1971 paper presented and reasons for differences given. Accuracy of estimates and run times are compared against those predicted in and those of all digital filters performing the same estimation.

AD-A015 857/6GA PC$3.75/MF$2.25
Rockwell International Corp Anaheim Calif Electronics Research Div
Effects of Nuclear Radiation on Magnetic Bubble Domain Materials and Devices.
Rept. for Oct 73-Apr 74,
R. A. Williams. Apr 74, 29p Rept nos. C73-1102.2/501, Scientific-2 AFCRL-TR-74-0233
Contract F19628-73-C-0250
See also AD-782 015.

Descriptors: *Thin film storage devices, *Magnetic materials, *Radiation effects, Transient radiation effects, Iron alloys, Garnet, X rays, Electron irradiation, Thin films, Logic circuits, Yttrium compounds, Gadolinium compounds, Thulium compounds, Gallium com-

pounds, Ferrates, Shift registers, Magnetoresistance, Magnetic detectors, Substrates.
Identifiers: *Magnetic bubble domains, Permalloys.

The work covered in this report deals mainly with experiments to study transient radiation induced information loss in magnetic bubble domain devices. Two shift registers of 96 and 84 bits each were tested. These devices consisted of T-bar propagation loops with a chevron stretcher and thick permalloy (4000 A) magnetoresistive detector on a glass overlay. This overlay was mounted on proton implanted (YGdTm)3(GaFe)5o(12) material. Stored information was read out electrically before and after exposure to electrons. Experiments were performed with the stored domain pattern both stationary and propagating during exposure. Radiation-induced changes usually involved only 1 or 2 bits (bubbles) and the probability of a failure (change of one or more bits) per shot averaged less than 40%. The output of the domain detector was monitored during e-beam exposure and indicates a threshold of >3 x 10 to the 11th power rads(Si)/sec in a 30 ns pulse for generation of false read signals.

AD-A015 910/3GA PC$3.25/MF$2.25
Virginia Univ Charlottesville Research Labs for the Engineering Sciences
Resolution Enhancement of Discrete Optical Sensors.
Final rept.,
E. S. McVey, and K. C. Henderson. Sep 75, 19p
AFOSR-TR-75-1421

Descriptors: *Image processing, Optical images, Resolution, Sampling, White noise.
Identifiers: *Image enhancement.

The approach to the solution of the problem followed in this research has been to trade incremental motion of the sensor array or image and gray level information for increased resolution of black and white (two-level) images. Many techniques have been proposed for resolution enhancement by improving images corrupted by additive noise. However, a technique developed jointly by one of the authors makes it possible to resolve bits of information in the image space which are smaller in area than the area of the sensors in the array. The technique developed is an extension of the above technique which eliminates the requirement for known boundary conditions, and it extends the applicability to a more general class of problems. This enhancement technique is naturally divided into three functional areas. The first is a novel sensing arrangement first proposed by McRee and one of the authors. The second natural division of the process is the quantization of the samples. The third natural division of the process is the estimation of the state of the resolution elements based upon the quantized values of the samples and upon the known sample positions.

AD-A015 919/4GA PC$3.75/MF$2.25
New York Univ Bronx Computer Research Lab
Development of an On-Line Image Scanning and Processing System,
I. Chakravarty, and H. Freeman. Jul 75, 47p Rept no. CRL-40 AFOSR-TR-75-1293
Grant AF-AFOSR-2755-75

Descriptors: *Image processing, *Computer graphics, Input output devices, On line systems, Cathode ray tubes, Computer programming, Flying spot scanners.

This report describes the development of an on-line scanning and processing system. The system consists of a modified Litton Model 1120 high-resolution flying spot-scanner, an ADAGE AGT-30 graphics computer, the scanner to computer interface and various display 1/0 devices. The system forms a major component of a laboratory for computer graphics and image processing. The design of the system permits scanning and image processing under interactive control. The report is divided into two parts. The first consists of a description of the hardware and the second, of the software thus far developed for on-line scanning.

AD-A015 920/2GA PC$4.75/MF$2.25
Draper (Charles Stark) Lab Inc Cambridge Mass
Demonstration and Evaluation of a Fault-Tolerant Input/Output Network.
Final rept. Sep 74-Aug 75,
John F. McKenna, Jr. Sep 75, 88p Rept no. R-918
Contract N00014-75-C-0050

Descriptors: *Communications networks, *Input output devices, *Reliability(Electronics), Multiprocessors, Logic circuits, Redundant components, Interfaces, Data processing terminals, Computer programming.
Identifiers: *Fault tolerant computing, Data management systems, *Computer networks.

A digital computer input/output data network is evaluated as to its ability to be reconfigured, tested, and managed. The network is topologically more complex than a bus structure, each node being connected to three, rather than two, internodal links. The extra connectivity offers redundancy that can be used to tolerate failures of any kind in links as well as to circumvent paralysis of the system due to an actively malfunctioning node. The software overhead of the network amounts to less than 2K 16-bit words of instructions and data for a moderate size system. The bandwidth overhead is variable depending on the degree of security desired, and can range from several percent to tens of percent.

AD-A015 928/5GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind School of Electrical Engineering
A Graph-Theoretic Approach to Cluster Analysis.
Interim rept.,
Z. Chen, and K. S. Fu. Jul 75, 48p Rept no. TR-EE75-27 AFOSR-TR-75-1430
Grant AF-AFOSR-2661-74

Descriptors: *Clustering, *Pattern recognition, Graphics, Network flows, Invariance, Computations, Algorithms.
Identifiers: *Cluster analysis, *Graph theory, Computational complexity, Connectivity(Graphics), Nearest neighbor rules.

The problem of cluster analysis is formulated in the realm of graph theory. A graph-theoretic clustering technique is presented which makes use of the concepts of the connectivity of a graph, the network flow theory, the invariance principle and the k-nearest-neighbor threshold method of edge construction. Several major drawbacks of the existing clustering methods can be overcome by the proposed method. Computer experiments of the application of the method to artificial and real data are reported.

AD-A015 929/3GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind School of Electrical Engineering
Transition Network Grammars for Syntactic Pattern Recognition.
Interim rept.,
S. M. Chou, and K. S. Fu. 15 May 75, 8p AFOSR-TR-75-1297
Grant AF-AFOSR-2661-74
Presented at the Conference on Computer Graphics, Pattern Recognition and Data Structure, Los Angeles, Calif., 14-16 May 75.

Descriptors: *Pattern recognition, Syntax, Grammars.
Identifiers: Natural language, Pushdown automata, Finite state machines, *Automata theory, Turing machines.

The application of transition network grammars to syntactic pattern recognition is studied in this paper. The relation between basic transition networks and context-free grammars is demonstrated. Augmented transition networks can be used to represent context-sensitive, or even type 0 languages. Stochastic transition networks are defined and the parsing of languages represented by transition networks and stochastic transition networks investigated. Error-correcting parsing algorithms are proposed from the viewpoint of syntactic pattern recognition. The voice-chess grammar is used in an experiment to illustrate various parsing results.

AD-A015 934/3GA PC$3.25/MF$2.25
Michigan Univ Ann Arbor Graduate School of Business Administration
Evaluation and Selection of File Organizations through Analytic Modeling,
S. B. Yao, and A. G. Merten. 1975, 24p AFOSR-TR-75-1294
Contract MDA903-74-C-0300, Grant AF-AFOSR-2219-72
Prepared in cooperation with Purdue Univ., Lafayette, Ind. Dept. of Computer Science. Report on Data Base Design and Evaluation - DE 701.

Descriptors: *Data bases, *Computer programming, Information retrieval, Information systems, Mathematical models.
Identifiers: *File structures, *File organization.

In this paper, a single model and cost function is developed to characterize most of the file structures for a design problem is automated. A file design system is developed that can be used by a file designer to select good file organizations from a large number of alternatives. This generalized model makes explicit the principles underlying data base construction. The computer program which implements the model uses analytic optimization techniques to select file organizations.

AD-A015 942/6GA PC$3.25/MF$2.25
Defence Research Establishment Pacific Victoria (British Columbia)
An Adaptive Computer-Controlled Digital Filter -- An Application of the Hewlett-Packard 5470A Fourier Processor.
Technical memo,
R. F. MacKinnon, and J. L. Dorscher. Jun 75, 22p Rept no. DREP-TM-75-8

Descriptors: *Digital filters, *Data processing, Time series analysis, Fourier transformation, Band pass filters, Microprogramming, Adaptive systems, Canada.
Identifiers: Fast Fourier transform, HP 5470A Fourier processor, Adaptive filtering.

One-stage digital filters are described mathematically. An expression for average power gain over a frequency interval is derived. Antibias, anti-alias and band-pass filters are presented as examples. Microprograms to implement such filters on a Hewlett-Packard 5470A Fast Fourier Processor are presented together with a timing table. The facility so described enables a user to filter adaptively under computer control.

AD-A015 958/2GA PC$3.75/MF$2.25
Naval Academy Annapolis Md
The Design and Analysis of a Generalized Interface System for the PDP-8 Computer.
Research rept.,
James Allan Phillips. 22 May 75, 28p Rept no. USNA-TSPR-71
Report on a Trident Scholar Project.

Descriptors: *Minicomputers, *Computer programming, Interequipment communication, Interfaces, Read only memories, Analog to digital converters, Digital to analog converters.
Identifiers: *PDP-8 computers.

This report is a design of a generalized interface system between the PDP-8 computer and external hardware devices. The project was initiated while working with the PDP-8 and recognizing that only a small percent of the computers potential was actually available to the user. - The research is divided into two phases: 1. The design of a bootstrap loader to increase the memory capacity of the PDP-8. 2. The practical application of the computer to service many users in a laboratory environment. The final system designs are described in the paper. These two interface designs offer the PDP-8 greater potential in memory capacity and on the other hand users participation. - When implemented, these systems will aid the PDP-8 in becoming an invaluable tool in laboratory for research and training assistance. (Author)

AD-A016 027/5GA PC$3.75/MF$2.25
George Washington Univ Washington D C Inst for Management Science and Engineering
An Empirical Stopping Rule for Debugging and Testing Computer Software.
Scientific rept.,
Ernest H. Forman, and Nozer D. Singpurwalla. 18 Aug 75, 27p Rept no. Serial-T-320
Contracts N00014-75-C-0729, F33615-75-C-4040

Descriptors: *Computer programming, *Debugging(Computers), Failure, Reliability, Statistical analysis.
Identifiers: *Computer program reliability, Stopping rules(Mathematics), Parameter estimation, Operating systems(Computers).

In this paper the authors introduce the problem of computer software reliability and discuss a probabilistic model for describing the failure of software. The authors suggest a procedure for estimating the parameters of the model, and propose a stopping rule for debugging the software. The authors also obtain an expression for additional testing of the software by considering the cost of testing, the cost of the failure of the software during its intended operation, and the power of the testing procedure.

AD-A016 131/5GA PC$3.25/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
Optical Power Spectrum Analysis (OPSA). Report no. 1. Recording Optical Spectrum Analyzer System Hardware,
Robert D. Leighty. May 75, 25p Rept no. ETL-TR-74-11

Descriptors: *Pattern recognition, Image processing, Spectrum analyzers, Power spectra, Optical equipment, Aerial photography.

The optical spectrum analyzer hardware used in pattern recognition research at the Research Institute, US Army Engineer Topographic Laboratories, is discussed in detail. This system involves detection of signals by a segmented spatial frequency plane detector in a coherent optical system when selected portions of an aerial image are illuminated. These signals are then electronically processed and formatted for digital computer processing with pattern recognition software. It is anticipated that the system will lead to applications for automated information extraction from aerial imagery which include cloud screening, extraction of selected planimetric information, image quality analysis, and techniques for automated selection of image preprocessing requirements.

AD-A016 136/4GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Rational Construction of Mathematical Models of Objects in Computer Processing of Geometric Information,
D. M. Zozulevich. 14 Apr 75, 25p Rept no. FTD-HC-23-2703-74
Edited trans. of mono. Vychislitelnaya Tekhnika v Mashinostroenii, Minsk, Dec 70 p3-16.

Descriptors: *Data processing, Computer applications, Geometric forms, Translations, USSR.

The paper anaiyzes the principal steps in computer processing of geometric information in the course of automatic or semiautomatic input, program analysis and synthesis and output to representation units.

AD-A016 137/2GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Successful International Testing of JSEP EC 7902 - Czechoslovak Compound Unit for Tape Punching,
L. Vilner, J. Kovarik, and M. Kepka. 1 May 75, 17p Rept no. FTD-HC-23-1130-75
Edited trans. of Mechanizace, Automatizace Administrativy (USSR) v13 n12 p479-482, 487 1973.

Descriptors: *Input output devices, Data processing, Tests, Punched tape, Czechoslovakia, Translations.

Contents:
- Successful international testing of JSEP EC 7902 - Czechoslovak compound unit for tape punching;
- Service computer centers Maschinelles Rechnen in the German Democratic Republic;
- International testing of the output column puncher EC 7014 in National Enterprise Arithma.

AD-A016 222/2GA PC$3.75/MF$2.25
Illinois Univ At Urbana-Champaign Center for Advanced Computation
ILLIAC IV Applications Research.
Final semi-annual technical rept. 1 Jul-31 Dec 74,
31 Dec 74, 48p Rept no. UIUC-CAC-DN-177
Contract DAHC04-72-C-0001, ARPA Order-1899
See also report dated 31 Mar 74, AD-786 172.

Descriptors: *Computer applications, Parallel processing, Image processing, Computations, Communications networks, Numerical analysis.
Identifiers: Illiac 4 computer, ARPA computer network, Computer networks.

During this period work was performed in the following areas: (1) Development of numerical techniques suitable for parallel processing; (2) ILLIAC IV multispectral image processing; (3) Research in distributed computational systems of heterogeneous computers; (4) Research and development of network access.

AD-A016 227/1GA PC$3.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Bounds on the Speed-Up of Parallel Evaluation of Recurrences,
L. Hyafil, and H. T. Kung. Sep 75, 19p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111

Descriptors: *Parallel processing, Multiprocessors, Network flows, Theorems.
Identifiers: Illiac 4 computer, Graph theory.

To understand the performance of parallel computers such as ILLIAC IV and C.mmp, the largest speed-up that can be obtained for a given task must be known. If there are k processors, the largest speed-up that can be achieved is k and the authors call this optimal speed-up. The speed-ups in general depend on the parallel decompositon of a particular computing task and the various aspects of the multiprocessing system, including memory contention, process communication, operating system overhead, etc. In this paper, the authors concentrate on the issue of decomposing tasks, and assume that the multiprocessing system is idealized so that it causes no delays at all. It is shown that even under this idealized assumption, there are problems for which, because the parallel decompositions are inherently difficult, the optimal speed-up cannot be achieved.

AD-A016 239/8GA PC$3.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Annapolis Md Propulsion and Auxiliary Systems Dept
Machinery Simulation Facility User's Guide to Analog/Hybrid Computer Scaling Techniques,
D. Baker. Oct 75, 43p Rept no. PAS-75-33

Descriptors: *Computer programming, *Analog computers, Computerized simulation, Input output processing, Attenuators, Hybrid computers.
Identifiers: Log density functions, Exponential density functions.

Basic scaling techniques and procedures for analog computers are presented and explained. Different procedures are compared. Scaling techniques for various nonlinear units are discussed. Scaling techniques for taking maximum advantage of the digital portion of the hybrid computer in setting up analog problems or the analog portion of hybrid problems are presented.

AD-A016 281/8GA PC$7.25/MF$2.25
Bolt Beranek and Newman Inc Cambridge Mass
The Terminal Interface Message Processor Program.
Sep 75, 221p Rept no. Technical Information-91
Contracts DAHC15-69-C-0179, F08606-73-C-0027
Supersedes report dated Dec 74, AD/A-003 470.

Descriptors: *Communications networks, *Computer programming, *Data processing terminals, Message processing, Memory devices, Shift registers.
Identifiers: Computer networks, ARPA computer network, *IMP(Interface Message Processor), Interface message processor, *TIP computer program, Protocols.

Because the terminals connected to a TIP communicate with Hosts at remote sites, the TIP, in addition to performing the IMP function, also acts as intermediary between the terminal and the distant Host. This means that network standards for format and protocol must be implemented in the TIP. One can thus think of the TIP software as containing both a very simpleminded mini-Host and a regular IMP program.

AD-A016 286/7GA PC$4.75/MF$2.25
Desmatics Inc State College Pa
Automated Response Surface Methodology in Digital Computer Simulation (U). Volume I: Program Description and User's Guide.
Technical rept.,
Dennis E. Smith. Sep 75, 100p Rept no. TR-101-1
Contract N00014-74-C-0148

Descriptors: *Digital simulation, *Computer programming, Statistical analysis, Iterations, Search theory, Algorithms, Optimization, Computations.
Identifiers: *Response surface analysis.

A modular computer program based on the statistical techniques of Response Surface Methodology has been developed to conduct the task of seeking optimum solutions to problems being simulated on a digital computer. The program, which may be used for constrained or unconstrained optimum-seeking in conjunction with deterministic or Monte Carlo simulations, is now available to potential users. This report volume describes the program and serves as a user's guide. A second volume contains program flowcharts and listings.

COO-2487-1 PC$6.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge.
Feasibility Study of a Collaboration Between the Laboratory for Nuclear Science and the Information Processing Center at MIT in Joining the ARPA Network. Progress Report, July 15, 1974--July 14, 1975.
H. Baumel, and E. J. Campbell. 1975, 62p
Contract AT(11-1)-2487

Descriptors: (*Computers, *Data transmission), Information, On-line systems, Programming.

For abstract, see NSA 3208

JINR-P10-8622 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Search Strategy in the Jinr Information Retrieval System.
D. D. Arnaudov. 1975, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Jinr, *Information retrieval), Data processing, Feedback, Interactive display devices.

For abstract, see NSA 32 08, number 21774.

LBL-3655 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Design Tools for Data Handling Systems.
G. Ringland. 31 Jan 75, 18p CONF-750229-2
Contract W-7405-eng-48

Descriptors: (*On-line systems, *Design), (*Data processing, *Diagrams), Information, Operation.

For abstract, see NSA 32 08, number 21794.

LBL-3659 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Data Structure Charting Methods.
E. Hart, and G. Ringland. 31 Jan 75, 17p CONF-750229-1
Contract W-7405-eng-48

Descriptors: (*Data processing, *Diagrams), Computers, Information, Management.

For abstract, see NSA 32 08, number 21795.

LBL-3801 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Software in Resource Sharing: Scientific.
D. F. Stevens. Mar 75, 10p CONF-750342-2
Contract W-7405-ENG-48

Descriptors: (*Computers, *Operation), Data processing, Documentation, Personnel, Programming.

For abstract, see NSA 32 08, number 21796.

LBL-3807 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Business and Scientific Computing: A Peaceful Coexistence.
R. J. Harvey. 18 Oct 74, 9p CONF-741041-3
Contract W-7405-eng-48

Descriptors: (*Computers, *Management), Operation.

For abstract, see NSA 32 08, number 21797.

LBL-3808 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Experiences in Resource Sharing.
R. J. Harvey. 20 Mar 75, 13p CONF-750342-1
Contract W-7405-ENG-48

Descriptors: (*Computers, *Uses), (*Lawrence berkeley laboratory, Computers), Mathematics, Operation, Programming.

For abstract, see NSA 32 08, number 21798.

N75-30433/7GA PC$4.25/MF$2.25
Radio Corp. of America, Camden, N.J. Advanced Technology Labs.
Cmos Array Design Automation Techniques.
P. Ramondetta, A. Feller, R. Noto, and T. Lombardi. May 75, 68p NASA-CR-120683
Contract NAS12-2233

Descriptors: *Automata theory, *Computer design, *Logic design, *Metal oxide semiconductors, Bits, Circuit diagrams, Computer components, Logic circuits, Silicon, Transistors.

For abstract, see STAR 1321

N75-30633/2GA PC$3.75/MF$2.25
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
Spline Function Approximation Techniques for Image Geometric Distortion Representation.
P. E. Anuta. 9 Sep 75, 44p NASA-CR-144397, LARS-103174
Contracts NAS9-14016, NGL-15-005-112

Descriptors: *Least squares method, *Multispectral band scanners, *Pattern registration, *Remote sensors, *Spline functions, Aerial photography, Algorithms, Computer techniques, Image motion compensation, Polynomials.

For abstract, see STAR 1321

N75-30815/5GA PC$3.25/MF$2.25
National Aerospace Lab., Tokyo (Japan).
Comparative Study of Counting Methods by Digital Simulation.
K. Yamane, K. Takeuchi, K. Ono, and H. Asada. Feb 75, 10p NAL-TR-408
In Japanese; English Summary.

Descriptors: *Counting, *Digital simulation, Amplitudes, Frequencies, Random noise.

For abstract, see STAR 1321

N75-30842/9GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Two-Dimensional Convolute Integers for Optical Image Data Processing and Surface Fitting.
T. R. Edwards, and R. D. Knight. 28 May 75, 35p NASA-TM-X-64949

Descriptors: *Images, *Integers, *Optical data processing, Algorithms, Bandpass filters, Least squares method, Regression analysis.

For abstract, see STAR 1321

N75-30859/3GA PC$3.25/MF$2.25
Tennessee Univ., Knoxville. Electrical Engineering Dept.
Adaptive Statistical Pattern Classifiers for Remotely Sensed Data.
Final Report.
R. C. Gonzalez, M. O. Pace, and H. S. Raulston. Jun 75, 16p NASA-CR-143922, TR-EE/CS-75-10
Contract NAS8-30878

Descriptors: *Data acquisition, *Pattern recognition, *Remote sensors, Algorithms, Approximation, Optimization, Stochastic processes.

For abstract, see STAR 1321

N75-30862/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Impact of Coverage on the Reliability of a Fault Tolerant Computer.
S. J. Bavuso. Sep 75, 25p NASA-TN-D-7938, L-10050

Descriptors: *Computers, *Mathematical models, *Reliability, Faults, Systems analysis.

For abstract, see STAR 1321

N75-30934/4GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Users Guide for Information Retrieval Using APL.
A. Shapiro. Aug 74, 19p NASA-TM-X-72578, NSSDC-74-11

Descriptors: *Information retrieval, *Programming languages, *User manuals (Computer programs), Computer programming, Data bases, Real time operation, Search profiles.

For abstract, see STAR 1321

N75-30935/1GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Configuration Description and Load Analysis for the Atmospheric and Oceanographic Information Processing System (Aoips).
J. T. Dalton. Jul 75, 41p NASA-TM-X-70960, X-933-75-217

Descriptors: *Computer techniques, *Data processing, *Earth resources, *Information systems, *Meteorology, *Oceanography, *Systems analysis, Computer storage devices, Digital computers, Earth resources information system, Flow charts, Imaging techniques, Minicomputers.

For abstract, see STAR 1321

ORNL-4951(Rev.1) PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.
On-Line Conversational Retrieval System for Orchis Text-Oriented Data Bases: User'S Manual.
V. A. Singletary. May 75, 72p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *O codes), (*Information retrieval, Computer codes), Ibm computers, Interactive display devices, On-line systems.

For abstract, see NSA 3208

ORNL-4961 PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.

Generalized Least-Squares Program for Use on a Remote Terminal.
F. H. Sweeton. May 75, 51p
Contract W-7405-eng-26

Descriptors: (*Least square fit, Computer codes), (*Computer codes, *L codes), Fortran, Interactive display devices, Pdp computers.

For abstract, see NSA 3208

PAT-APPL-442 530/GA PC$3.75/MF$2.25
Department of the Navy Washington D C
Serial-Access Linear Transform Device.
Patent Application,
Jeffrey M. Speiser, and Harper John Whitehouse. Filed 14 Feb 74, 29p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data processing equipment, *Signal processing, Patents, Linear systems, Transformations(Mathematics), Coding, Generators, Time, Read only memories, Shift registers, Correlators.
Identifiers: Linear transformations, *Patent applications, PAT-CL-444-1.

The patent application relates to a serial access linear transform device, suitable for signal processing systems requiring the rapid generation o linear transforms of a spatial or temporal signal, where the transform is in sampled form consisting of a series of N-sample terms, each term consisting of factors, and where the signal consists of a series of N-sample pulses. The transform device includes a time code generator which generates a plurality of pulses, either singly or sequentially, at predetermined intervals of time, and serves as a clocking and synchronizing source for the transform device, and a data source for accepting the signal which is to be processed into the form of a linear transform.

PAT-APPL-565 305/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Method and Means to Access and Extended Memory Unit.
Patent Application,
Varton Kosharian. Filed 4 Apr 75, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Memory devices, Patents, Access, Control, Registers(Circuits), Addressing.
Identifiers: *Patent applications, PAT-CL-340-172-5-R-9.

The patent application relates to access to additional memory provided by extending two registers and adding a no-index register reference which creates an extended data address register for directly addressing the additional memory.

PAT-APPL-576 733/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
High Speed Optical Matrix Multiplier System.
Patent Application,
Larry B. Stotts. Filed 12 May 75, 21p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Semiconductor devices, *Computer applications, *Matrices(Mathematics), Signal processing, Optical processing, Computations, Patents, Optical waveguides.
Identifiers: Multiplication, *Patent applications, PAT-CL-235-181.

The patent application describes a matrix-vector multiplication system which is accomplished by continuous wave polarized light energy transmitted along a plurality of optical waveguides through modulation by a first optical modulator in response to a column vector type input signal and additional modulation by a second optical modulator in response to a row vector type input signal. The resultant modulated light energy outputs are received by a polarization analyzer for transforming modulations in polarization and phase to commensurate amplitude modulations. A photo-responsive storage and integrating means receives the light energy associated with each of the optical waveguides and develops a cumulative signal representative of the matrix-vector multiplication.

PAT-APPL-577 365/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Magnetic Shielding of Computer Components from Lightning.
Patent Application,
Robert I. Hill, Jr. Filed 13 May 75, 14p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Magnetic cores, *Memory devices, *Electromagnetic shielding, Patents, Lightning, Data storage systems.
Identifiers: *Patent applications, PAT-CL-174-5, *Magnetic storage.

The patent application concerns shielding of equipment from magnetic and electromagnetic field disturbances and, more particularly, shielding magnetic storage and memory devices from changes in magnetic and electromagnetic fields caused by lightning.

PATENT-3 900 741 Not available NTIS
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Fault Tolerant Clock Apparatus Utilizing a Controlled Minority of Clock Elements.
Patent.
W. M. Daly, and J. F. Mckenna, Jr.. Patented 19 Aug 75, 10p PAT-APPL-354 612
Misc-Filed 26 Apr. 1973 Supersedes N73-22386 (11 - 13, p 1528). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Clocks, *Digital computers, *System failures, Logic circuits, *Patents, Time lag.
Identifiers: PAT-CL-307-204.

A fault-tolerant clock apparatus is presented for use in digital logic systems. The apparatus maintains output pulses during component failures.

PEL-241 PC$8.75/MF$2.25
Atomic Energy Board, Pelindaba, Pretoria (South Africa).
Selective Dissemination of Information with Special Reference to sa/Inis/Sdi.
E. Butterly. Oct 74, 115p
U.S. Sales Only.

Descriptors: (*South africa, Information systems), (*Information systems, *Efficiency), Comparative evaluations, Information retrieval, Inis.

For abstract, see NSA 3208

RT/EDP-(74)7 PC$4.75/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Program for the Estimation of Parameters in Mixed Linear--Nonlinear Models.
F. Cesari, and C. Corradi. Nov 74, 31p
In Italian. U.S. Sales Only.

Descriptors: (*Least square fit, *Computer codes), Fortran, Ibm computers, Nonlinear problems.

For abstract, see NSA 3208

SAND-74-5479 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Distributed Computing Systems and the Testing Laboratory.
T. S. Rathke. 1974, 11p CONF-750502-3

Descriptors: (*Computers, *Planning), Configuration, Economics.

For abstract, see NSA 32 08, number 21801.

TID/SNA-1756 PC$4.00/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Kalman Filtering.
E. A. Parziale. 10 Aug 71, 9p

Descriptors: Differential equations, Least square fit, Noise, Optimization, Stochastic processes.

For abstract, see NSA 32 08, number 21804.

TID-26500R1 PC$4.00/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Subject Categories Used in Nuclear Science Abstracts, 1967--1975.
M. O. Whitson. Jul 75, 23p

Descriptors: (*Us aec, *Information systems), Information retrieval.

For abstract, see NSA 32 08, number 21777.

TID-26770 PC$5.45/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
An Analysis of World-Wide Contributions to Nuclear Science Abstracts, Volumes 27 and 28(1973).
J. D. Cape. Jun 75, 77p

Descriptors: Diagrams, Documentation, Information retrieval, Information systems, Nuclear data collections, Tables.

For abstract, see NSA 32 08, number 21778.

UCLA-34P214-6 PC$8.25/MF$2.25
California Univ., Los Angeles Dept. of Computer Science.
Implementation of the Burroughs D-Machine.
F. C. Webster. Jun 74, 101p UCLA-ENG-7449
Contract AT(04-3)-34

Descriptors: (*Computers, *Design), Logic circuits, Programming.

For abstract, see NSA 3208

UCRL-76139 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Mathematical Analysis of Computations Required to Access Secondary Storage Devices by Random Methods and Sequential Methods.
S. Szabo. 23 Oct 74, 9p CONF-741001-59

Descriptors: Computers, Magnetic disks, Mathematics, Memory devices, Performance.

For abstract, see NSA 32 08, number 21807.

UNI-339 PC$4.50/MF$2.25
United Nuclear Industries, Inc., Richland, Wash.
Slide Layout and Integrated Design (Slide) Program.
S. G. Roberts. 19 Mar 75, 27p
Contract AT(45-1)-1857

Descriptors: (*Computer codes, *S codes), (*Computer graphics, Computer codes), Color, Fortran.

For abstract, see NSA 32 08, number 21808.

9C. Electrical and Electronic Engineering

AD-A015 945/9GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Operator's Manual for the Compact X-Ray Analyzer.
Memorandum rept.,
J. V. Gilfrich. 9 Sep 75, 19p Rept no. NRL-MR-3131
Adjunct to Rept. no. NRL-7926 dated 26 Aug 75, AD-A014 582.

Descriptors: *X ray spectroscopy, Air pollution, Fluorescence, X ray tubes, Spectrometers, Pulse amplifiers, Pulse height analyzers.
Identifiers: Air pollution detection.

A low cost, compact wavelength dispersion x-ray fluorescence analyzer has been built by the Naval Research Laboratory for the Environmental Protection Agency. This report documents the recommended method of operation of this instrument and includes diagrams of the special components fabricated for it. (Author)

JPRS-65653-1 PC$7.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
Principles of the Theory of Radio Electronic Systems of Marine Objects. Part I,
K. Yu. Agranovskii, P. I. Kiselev, and E. A. Svyadoshch. 11 Sep 75, 202p
Trans. of mono. Osnovy Theorii Radioelektronnykh Sistem Morskikh Obektov, Leningrad, 1974 p1-351.

Descriptors: *Electronic engineering, *Information theory, Detection, Electric equipment, Identification systems, Underwater sound equipment, Translations, USSR.

The report contains an examination of problems dealing with the detection and identification of marine objects using radio electronic systems. Description is given of systems design and of the physical principles of their operation. Rescue and recovery techniques are discussed.

PAT-APPL-570 933/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Recirculation of Liquid Metal Current Collectors in Acyclic Machines.
Patent Application,
Burton D. Hatch, and Donald W. Jones. Filed 22 Apr 75, 18p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electric motors, Patents, Superconductors, Liquid metals, Recirculation, Head(Fluid mechanics), Reduction.
Identifiers: PAT-CL-310-219, *Patent applications.

The patent application describes a method and means for reducing the differential head across the rotor of superconducting electric motors by creating a recirculation action in the rotor return path. The recirculation is achieved by permitting the liquid metal flow path to return through the rotor in order to resupply liquid metal to the inlet side of the collector after the expulsive Lorentz force which acts on the liquid metal at the collector has raised the height of liquid metal on the outlet side of the collector to sufficient centrifugal head, or gravity head at low speeds, to cause the liquid metal to return to the inlet side of the collector through insulated, low impedance paths through the rotor.

9D. Information Theory

AD-A015 637/2GA PC$7.00/MF$2.25
Naval Underwater Systems Center New London Conn New London Lab
Robust Sequential Probability Ratio Detectors.
Technical rept.,
Joseph J. Wolcin, III. 11 Sep 75, 182p Rept no. NUSC-TR-5223

Descriptors: *Signal processing, *Statistical analysis, Sequential analysis, White noise, Hypotheses, Statistical tests, Sampling.
Identifiers: *Signal detection, Robust procedures, Sequential probability ratio tests.

A statistical hypothesis test is developed for situations in which uncertainty exists in the underlying probability distributions of the observations. The resulting test, called the robust sequential probability ratio test (RSPRT), provides a theoretical framework within which specific detection problems can be formulated. As the name implies, the RSPRT is sequential in nature, and it guarantees a given performance level (in terms of error probabilities). Application of the RSPRT requires the definition of disjoint classes of distributions which contain the distribution of the observations under each respective hypothesis, the determination of 'least favorable' sequences of distributions. The likelihood ratio between these sequences forms the basic structure of the test. The RSPRT is applied to two models of uncertainty which frequently arise in practice. In the first, the distribution of the observations under each hypothesis is known to lie in the neighborhood of some known nominal distribution, but the exact distributional form is unknown. In the second model, the observations have known univariate Gaussian distributions, but compositeness of the hypotheses results because of uncertain correlation between the observations. In each case the performance measures of the test are examined in detail. The RSPRT is shown to be far superior to a fixed sample size robust test in terms of expected observation length.

AD-A015 765/1GA PC$3.75/MF$2.25
Rdp Inc Bedford Mass
Digital Filtering Analysis Applied to the Atmosphere Explorer-C Satellite MESA Accelerometer Data.
Interim rept.,
Joseph P. Noonan, Robert W. Fioretti, and Barry Hass. 15 Feb 75, 41p Rept no. Scientific-1 AFCRL-TR-75-0293
Contract F19628-73-C-0142

Descriptors: *Signal processing, *Digital filters, Telemetering data, White noise, Fourier analysis, Fourier transformation, Accelerometers, Scientific satellites.
Identifiers: Explorer C satellite.

This report summarizes the mathematical and data analyses required to extract scientifically meaningful data from a total output signal degraded by noise. The methods described use digital filtering techniques, and the results are applied specifically to scientific accelerometer data flown aboard the Atmosphere Explorer satellite. Atmospheric drag and density variations are calculated using these methods. The results given will be incorporated by analysts and experimenters into presentations given at scientific meetings.

AD-A015 805/5GA PC$3.25/MF$2.25
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
Spectral and Spatial Adaptive Processing of Array Data.
Interim rept.,
C. H. Chen. 6 Aug 75, 17p Rept no. EE-75-6
AFOSR-TR-75-1353
Grant AF-AFOSR-2119-71

Descriptors: *Signal processing, Entropy, White noise, Adaptive systems, Fourier Transformation.

The first part of this tutorial paper is concerned with the comparative evaluation of signal processing techniques. It is shown that all linear filter (prediction) techniques are highly correlated. Nonlinear signal processing techniques are much needed. The use of maximum entropy method in spectral and spatial processing of the array data is emphasized. Adaptive processing becomes necessary for highly nonstational signals. The second part of the paper deals with the adaptive mean level detector and the use of pattern recognition techniques as an aid to the array data processing. Extensive references are provided in the bibliography section of the paper.

AD-A015 867/5GA PC$4.25/MF$2.25
University of Southern California Los Angeles Dept of Aerospace Engineering
Singular Perturbation for Non-Linear Filter Densities.
Master's thesis,
Richard Ralph Tye. Aug 75, 72p AFOSR-TR-75-1379
Grant AF-AFOSR-2141-71

Descriptors: *Information theory, *Algorithms, Theses, Filters, Nonlinear systems, Phase, Demodulators, Perturbations, Density, Convolution integrals, White noise, Power series.
Identifiers: *Nonlinear filters, Phase demodulators.

For discrete periodic sensors and multi-dimensional white noise sources, with the source covariance matrix proportional to a scalar source noise parameter > o, the one-step predictor and the filter conditional densities are represented by a power series in the source noise parameter. Let n be an integer and 1/delta be the sampling rate. Then the coefficients of the power series at time n delta are differential operators acting on the conditional filter density at time (n-1) delta. A set of difference equations is derived which relates the jth coefficient of the series at time n delta to the k, k=o, 1, ..., j, coefficients of the series at time (n-1) delta. This difference equation is applied to a phase demodulator sensor with a one-dimensional Brownian motion source. For j=1, the Fourier transform of the difference equation is computed, and is shown to be identical to one obtained for this filtering system by other methods. The difference equation is used to derive a series solution for a phase demodulator which senses the first integral of Brownian motion. A sub-optimal filter is constructed from the Fourier transform of the difference equation. (Author)

AD-A015 926/9GA PC$3.25/MF$2.25
University of Southern California Los Angeles Dept of Aerospace Engineering
High Speed Convolution of Periodic Functions,
R. S. Bucy, A. J. Mallinckrodt, and H. Youssef. 1975, 14p AFOSR-TR-75-1349
Grants AF-AFOSR-2141-71, NSF-OIP74-20601

Descriptors: *Signal processing, *Phase modulation, *Periodic functions, Demodulation, Mapping(Transformations), Theorems, Nonlinear systems.
Identifiers: *Nonlinear filtering, Banach algebras.

An approximate homomorphism between the Banach Algebras of periodic functions of one variable and that of periodic functions of two variables is studied. Application to device synthesis of nonlinear filters is indicated.

AD-A015 933/5GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Electrical Engineering
System Modeling and Statistical Data Processing.
Interim rept.,
Thomas Kailath, and Thomas Cover. 1975, 25p
AFOSR-TR-75-1287
Contract F44620-74-C-0068

Descriptors: *Signal processing, *Statistical analysis, Information theory, Speech recognition, Stochastic processes, Algorithms, Pattern recognition.
Identifiers: Signal detection.

This report is a brief summary of progress made by the authors and their associates during the period 1 May 1974 through 30 April 1975 in a continuing research project concerned with statistical signal processing. The several research tasks described include (1) scattering theory and least-square estimation, (2) applications of orthogonal polynomials, (3) time-invariant causal implementations of Gaussian signal detectors, (4) fast algorithms for arbitrary processes, (5) square-root algorithms for estimation, (6) extended transfer functions and systems matrices, (7) fast algorithms in speech processing, (8(minimal realization problems, (9) nearest neighbor pattern recognition, (1) Kolmogorov complexity, (11) compound sequential Bayes predictors for sequences with an empirical Markov structure, (12) optimal finite memory learning algorithms for the finite sample problem, (13) measurement selection in the k-hypothesis testing problem, and (14) estimating the entropy of English language text. A list of publications containing the detailed research findings is provided.

N75-30816/3GA PC$3.25/MF$2.25
Australian Post Office Research Labs., Melbourne.
Simple Approximations to Digital Error Rate Due to Intersymbol Interference and Gaussian Noise.
J. V. Murphy. Oct 74, 15p REPT-6929

Descriptors: *Digital systems, *Error analysis, *Normal density functions, *Random noise, Channels (Data transmission), Numerical analysis, Signal to noise ratios, Specific impulse.

For abstract, see STAR 1321

N75-30828/8GA PC$3.25/MF$2.25
Notre Dame Univ., Ind. Dept. of Electrical Engineering.
Some Long, Rate One-Half, Binary Convolutional Codes with an Optimum Distance Profile and the Systematic Versus Nonsystematic Code Question.
R. Johannesson. 19 Aug 75, 8p NASA-CR-143353, EE-756
Grant NSG-5025
Subm-Sponsored in Part by the Swedish Board for Technical Develop.

Descriptors: *Binary codes, *Decoders, *Sequential computers, Probability theory, Random errors, Tables (Data).

For abstract, see STAR 1321

9E. Subsystems

AD-A015 630/7GA PC$7.00/MF$2.25
Naval Air Systems Command Washington D C
Conformal Antennas, Research Program Review and Workshop Held at Crystal City, Arlington, Virginia, on 15-16 April 1975.
Apr 75, 190p

Descriptors: *Antenna arrays, *Meetings, Conformal structures, Antenna radiation patterns, Antenna feeds, Guided missile antennas, Aircraft antennas, Radar antennas, Polarization.

Contents:
Conformal arrays in tactical missiles, RPVs, and aircraft
;
Polarization requirements for conformal arrays;
Discussion of a symmetrical multibeam feed networks for circular arrays;
Conical arrays, studies and experiment;
Surface ray analysis of conformal arrays;
Flush mounted radiating elements for conformal arrays;
Analysis of arrays on a conducting conical surface;
Circular and cylindrical arrays;
STAR - A conformal array technique for airborne application;
Conformal antenna array configurations report;
Some issues in the application of cylindrical arrays to radars.

AD-A015 662/0GA PC$4.75/MF$2.25
Battelle Memorial Inst Columbus Ohio Columbus Labs
Development of Gaseous Media for SEF 3-Dimensional Displays.
Final rept. 22 Jan-31 May 75,
R. H. Barnes, C. E. Moeller, J. F. Kircher, and C. M. Verber. 31 May 75, 80p
Contract N00014-73-C-0254

Descriptors: *Display systems, *Molecular spectroscopy, *Fluorescence, Laser beams, Optical scanning, Three dimensional, Gas cells, Energy levels, Iodine compounds, Chlorides, Diatomic molecules, Iodine, Air traffic control systems, Human factors engineering.
Identifiers: *Three dimensional display systems, *Air traffic displays, Computer displays, Iodine chloride, Sequential excitation, Excitation cross sections, SEF(Sequential excitation of fluorescence), Sequential excitation of fluorescence.

This report describes recent progress in the development of gasous display media for 3-dimensional display systems based on two-step excitation of fluorescence. Two-step excitation of IC1 has been demonstrated. Two tunable lasers operating at different wavelengths were employed as excitation sources. Fluorescence was generated at wavelengths as long as 5700 A with sufficient intensity to be observed by eye. A mathematical analysis and experimental measurements were performed to determine the display characteristics of IC1. This information was then used to determine the potential display capabilities of IC1 based on currently available lasers. (Author)

AD-A015 675/2GA PC$3.75/MF$2.25
Syracuse Univ N Y Dept of Electrical and Computer Engineering
Design of Reactively Controlled Antenna Arrays.
Technical rept.,
Roger F. Harrington, Robert F. Wallenberg, and Alan R. Harvey. Sep 75, 42p Rept nos. TR-4, TR-75-10
Contract N00014-67-A-0378-0006

Descriptors: *Antenna arrays, Beam steering, Antenna radiation patterns, Circular antennas, Computer programs, Reactance, Transformers, Transmission lines, Directional antennas, Antenna feeds, Dipole antennas.
Identifiers: Univariate search, Design.

This report considers the use of variable reactance loads to control the beam direction of reactively loaded antenna arrays. The arrays considered have a single feed point, no transmission lines to the elements, and one reactive load per element. Only partial control of the array characteristics is possible using this scheme. The initial design of the array is obtained by resonating the desired port currents, and this is then improved by an optimum seeking univariate search method. This procedure gives good results for arrays of moderate numbers of relatively closely spaced elements. Several numerical examples are given for arrays of half-wavelength long dipole antennas. A computer program for the univariate search method, with operating instructions, is included. (Author)

AD-A015 723/0GA PC$5.75/MF$2.25
General Electric Co Utica N Y Aerospace Electronic Systems Dept
Evaluation of Lead Finishes for Microcircuit Packages.
Final technical rept. 23 Jan 74-23 Apr 75,
G. Schaefer, R. Ward, and L. Zakraysek. Jul 75, 140p RADC-TR-75-171
Contract F30602-74-C-0118

Descriptors: *Microcircuits, *Circuit interconnections, Finishes, Metal seals, Glass seals, Integrated circuits, Packaged circuits, Iron alloys, Nickel alloys, Cobalt alloys, Oxidation, Soldering.
Identifiers: Iron alloy 17Co 29Ni.

Oxidation studies made on several vendor Fe-Ni-Co (ASTM-F15) glass sealing alloys show these alloys to differ in both rate of oxidation and adherence of the oxide to the metal. Differences in surface preparation, surface roughness, and atmosphere control on rate and adherence were shown to affect both rate of oxidation and adherence. Using the curves established in these rate studies, samples were oxidized to predetermined thickness. Those selectively oxidized samples were 'sealed' with commercial glasses. Adherence of the glass to metal is shown to be related to oxide thickness and the energy input used in sealing.

AD-A015 724/8GA PC$4.75/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Test and Evaluation of Wire-Wound Tactical Air Navigation Aid (TACAN) Heated Radomes with Weather Sensors.
Interim rept. Dec 73-Mar 74,
Harold Postel. Sep 75, 78p Rept no. FAA-NA-74-45 FAA-RD-75-96

Descriptors: *Radomes, Tacan, Antennas, Heating, Detectors, Weather, Performance(Engineering), Heating coils, Field tests.
Identifiers: DOT/4IZ/ID, AN/GRA-120A.

The report covers preliminary field evaluation at the Newberg, Oregon, Very High Frequency Omnirange Tactical Air Navigation Aid (VORTAC) of an engineering model wire-wound Tactical Air (TACAN) radome and weather-sensing system. The evaluation was to determine the feasibility of the weather sensors and the wire-wound radome in preventing snow and/or ice buildup.

AD-A015 757/8GA PC$4.75/MF$2.25
Raytheon Co Waltham Mass Research Div
High-Efficiency Solid-State C-Band Generator.
Interim rept. 24 Jun-24 Dec 74,
R. N. Wallace. Jul 75, 81p Rept no. S-1814 RADC-TR-75-176
Contract F30602-74-C-0306

Descriptors: *Microwave oscillators, IMPATT diodes, C band, Radiofrequency generators, Gallium arsenides, Microwave equipment, Solid state electronics, Data links, Radio transmitters.

Progress toward the development of a 10 W CW 5 GHz generator having more than 25 percent efficiency and capable of being combined with similar units to produce 50 W output is described. To date, four-mesa GaAs Read IMPATT diodes with up to 8.6 W CW output and 20.7 percent efficiency at 5.15 GHz have been demonstrated. Efficiencies up to 28 percent and power outputs up to 4.4W CW in the 5 GHz range have been obtained from single-mesa devices. A 10 W diode at 5 GHz appears feasible. A cavity-type power-combining circuit capable of accommodating six such diodes is under construction and will be tested during the second half of the program.

AD-A015 766/9GA PC$3.75/MF$2.25
Hughes Aircraft Co Culver City Calif Antenna Dept
Hemispherically Scanned Antennas.
Final rept. Dec 71-Mar 75,
Alfred T. Villeneuve, Nicolaos G. Alexopoulos, and Wolfgang H. Kummer. May 75, 34p Rept nos. HAC-Ref-C5350-F, HAC-2265-31/488 AFCRL-TR-75-0294
Contract F19628-72-C-0145
See also report dated Dec 73, AD-779 695.

Descriptors: *Phased arrays, *Aircraft antennas, Antenna radiation patterns, Slot antennas, Air to space, Cylindrical bodies.

The report contains the results of a study of techniques for obtaining extended coverage element patterns for use on hemispherically scanned phased arrays on cylinders of large radius of curvature. It contains experimental patterns of slot radiators on such a cylinder covered with surface wave structures. Experimental patterns of slots coupled to parasitic dipoles extended around the cylinder are also included. An analysis that treats sources on reactive cylinders is performed to determine what type of surfaces will give extended coverage when the polarization is parallel to the cylinder axis. The results of the study indicate that improved coverage can be obtained using reactive surfaces that are selected to affect TE waves and TM waves in different manners. Such surfaces can be constructed by combining corrugated conductors and dielectric slabs. The combination can be selected to provide effectively the proper surface reactance to allow radiation near the horizon for both polarizations.

AD-A015 808/9GA PC$3.75/MF$2.25
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Computer Aided Analysis of Integrated Injection Logic.
Technical rept.,
Jeffrey Alan Niehaus. Sep 75, 46p Rept nos. R-689, UILU-ENG-75-2224
Contract DAAB07-72-C-0259

Descriptors: *Integrated circuits, *Logic circuits, Digital systems, Computerized simulation, Theses, Gates(Circuits), Computer applications.
Identifiers: *Integrated injection logic circuits, Computer aided analysis, Large scale integrated circuits, Logic design, SPICE computer program.

Integrated injection logic is a low power, high density bipolar logic family. The switching speed is inversely proportional to the current levels used, which can vary anywhere from the nA to microamp range. Since integrated injection logic is a current switching logic, it can operate over a wide range of supply voltages. Besides possessing a low speed power product, it has the highest packing density of any standard logic family. The paper compares results of derived equations with circuit simulations run under the Berkeley SPICE program on the DEC-10 Computer. Logic design with these multiple-output, single-input devices is also analyzed and simulated on the computer.

AD-A015 836/0GA PC$3.75/MF$2.25
Rand Corp Santa Monica Calif
A Little-Known Effect of Antenna Size on Signal Waveform.
Interim rept.,
T. F. Burke. Aug 75, 46p Rept no. R-1819-PR
Contract F44620-73-C-0011

Descriptors: *Antennas, *Radiation, Wave equations, Waveforms, Wavefronts, Far field, Distortion.

A review is given of the usual approximate solution of the calculation of the radiation field of an aperture to demonstrate an attribute of the solution which is widely overlooked and which describes a little-understood feature of the radiation field. The report presents a simple theoretical analysis of the phenomena associated with most antennas and shows representative examples of waveform distortion resulting from antenna effects.

AD-A015 989/7GA PC$4.25/MF$2.25
Hughes Research Labs Malibu Calif
Holographic Lens for Pilot's Head-Up Display.
Final rept. 1 Jul-31 Oct 74 on Phase 2,
Donald H. Close, Anson Au, and Andrejs Graube. 1 Apr 75, 59p NADC-75044-30
Contract N62269-74-C-0642

Descriptors: *Head up displays, *Lenses, Holography, Pilots.
Identifiers: *Holographic lenses.

This report describes work on the development of a hologram recording apparatus with a fringe control system for 16 in. diameter, 50 degrees off-axis, symmetric transmission holographic lens for pilot's Head-Up Display (HUD). The basic HUD system parameters are a 25 degrees field of view, a 25 in. eye relief, and a 3 in. by 5 in. wide exit pupil. The hologram geometry was chosen based on parametric analysis and preliminary studies on several Hughes continuous reflection and transmission hologram lens designs of Phase 1, Contract N62269-73-C-0388, Holographic Lens for Pilot's Head-Up Display. The work also includes design of processing equipment for large holographic lens elements recorded on 18 in. x 18 in. dye-sensitized dichromated gelatin, holographic plates. 18 in. x 18 in. x 0.25 in. thick photographic plates were procured under this contract.

AD-A016 181/0GA PC$3.75/MF$2.25
Naval Research Lab Washington D C
Cryogenic Loop Antennas for VLF reception in Seawater.
Interim rept.,
David L. Guerrino. 24 Sep 75, 27p Rept no. NRL-7901

Descriptors: *Loop antennas, Very low frequency, Underwater, Cryogenics, Underwater communications, Submarine antennas, Signal to noise ratio, Sea water, Losses.
Identifiers: Electrically small antennas, Squid devices.

The signal-to-noise ratio used to receive vlf transmissions will improve as the antenna temperature is lowered, even when the antenna is enclosed in an insulating radome and submerged in seawater. Noise (or losses) coupled into the antenna from the seawater will limit the improvement if the received atmospheric noise is small compared to the coupled sea noise. The coupled losses can be reduced by increasing the size of the radome. The loop does not have to be superconducting to achieve important gains in its signal-to-noise ratio. Several small 16-gauge copper wire loops were analyzed. Calculations showed that the signal-to-noise ratio of a 5.08-cm-diameter, untuned, single-turn loop, enclosed in a 30.48-cm-diameter radome and submerged in 4-mho/m water, will improve by a factor of about 104(40 dB) as the temperature of the antenna is lowered from 295 K to 20 K. The calculation was made at 20 kHz, and the noise level was assumed to be established by the real part of the antenna impedance. The signal level was held constant. A preamplifier using a superconducting quantum interference device (SQUID) appears to be the best suited for use with a small cryogenic loop antenna.

N75-30390/9GA PC$3.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif. Plasma Physics Group.
Study of the Performance of Antennas in Magnetized Plasmas.
Final Report.
R. L. Stenzel. 30 Jun 75, 46p NASA-CR-143927, TRW-27468-6004-RU-00
Contract NAS8-31175

Descriptors: *Antenna radiation patterns, *Plasma diagnostics, *Plasmas (Physics), Electric dipoles, Electrostatic probes, Polarization characteristics, Whistlers.

For abstract, see STAR 1321

N75-30391/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
L-Band, 1.2 M Parabolic Antenna-Noise Temperature Measurement.
R. E. Taylor, and J. S. Hill. Jul 75, 7p NASA-TM-X-70952, X-953-75-186
Subm-Submitted for Publication. Conf-Proposed for Presentation at the Intern. Telemetering Conf., Washington, D. C., 14-16 Oct. 1975.

Descriptors: *Noise temperature, *Parabolic antennas, *Temperature measurement, *Ultrahigh frequencies, Maritime satellites, Radiometers, Ships.

For abstract, see STAR 1321

N75-30434/5GA PC$3.75/MF$2.25
Hughes Aircraft Co., Culver City, Calif. Dept. of Microcircuit.
Contamination Control in Hybrid Microelectronic Modules. Identification of Critical Process and Contaminants, Part 1.
Final Report.
R. P. Himmel. May 75, 38p NASA-CR-143380, P75-111
Contract NAS8-30876

Descriptors: *Electronic modules, *Hybrid circuits, *Microelectronics, Contaminants, Electronic packaging, Protective coatings.

For abstract, see STAR 1321

PAT-APPL-514 706/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Discrete Cosine Transform Signal Processor.
Patent Application,
Robert W. Means. Filed 15 Oct 74, 17p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Signal processing, Patents, Image processing, Real time, Television systems, Fourier transformation.

Identifiers: *Patent applications, PAT-CL-340-366-CA.

The patent application describes a processor for performing a discrete cosine transform of an input signal, suitable for real-time television image processing, specifically for obtaining an acceptable picture when the number of bits of information available for describing the picture and/or the channel bandwidth are severely limited, comprising: two complex read-only memories, an input and output read-only memory, each containing a predetermined number of data points arranged in a predetermined manner; two complex multipliers, an input and an output multiplier, each having an input from one of the read-only memories, an input which is connectable to the external signal of N data values which is to be transformed discretely and cosinusoidally; a complex transversal filter, having 2N-1 taps, the input to the filter being the output of the input multipler; the output of the transform processor comprising the output of the output multiplier.

PAT-APPL-572 557/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Tracking Status Detector for a digital Delay Lock Loop.
Patent Application,
Chang C. Chen, Jack K. Holmes, and James L. Lewis. Filed 28 Apr 75, 15p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Phase locked systems, Patents, Detectors, Tracking, Digital systems, Analog systems, Phase locked communications.
Identifiers: *Patent applications, PAT-CL-331-12.

The patent application describes an unlocked detector for a digital delay lock loop which employs an up-down counter that periodically accumulates the algebraic sum of the quantized positive and negative adjustments made at a preselected rate by the incremental phase modulator. Whenever this sum reaches a specified threshold value corresponding to a particular phase error, an unlocked indication is given. Arrangements utilizing the same principle are disclosed for analog loops.

PAT-APPL-581 258/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Pseudo Sampling.
Patent Application,
Jon H. Bumgardner. Filed 27 May 75, 17p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Signal processing, *Samplers, Patents, Circuits, Field effect transistors, Pattern recognition.
Identifiers: *Patent applications, PAT-CL-340-347-AD.

In the field of pattern recognition some signal sources provide too much information too rapidly for conventional components to be employed with traditional sampling techniques. The result is, either much information is missed or distorted, or special expensive electronics must be created to do the necessary high speed sampling on the signal of interest. Even in the latter case the sensitivity and sampling rate necessary for some rapidly changing signals is too great for presently known techniques. One such application resides in the preparation of certain radar and laser pulse signals by digitizing for pattern recognition. The present patent application provides an inexpensive, relatively simple technique for pseudo sampling a signal.

PAT-APPL-585 142/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Light-Weight Low-Cost Antenna Element.
Patent Application,
David Proctor. Filed 9 Jun 75, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antenna arrays, Patents, Microwave antennas, Antenna components, Dielectric waveguides.
Identifiers: *Patent applications.

The patent application relates to an antenna array comprising a plurality of antenna elements formed from metal-clad boards and conductive pins. Two metal-clad boards are placed together to form a sandwich, the metal-clad surfaces of the boards forming the top and bottom walls of a waveguide. Pins are placed perpendicular to the clad surfaces to form the sidewalls. The signal is introduced by a coaxial probe in the broad wall of the waveguide in a conventional manner. A row of pins defines the backwall of the waveguide.

PAT-APPL-588 998/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
High Current Pulser Circuit.
Patent Application,
William S. Watson. Filed 20 Jun 75, 5p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Pulse generators, Patents, Drives(Electronics), Circuits, Light emitting diodes, Semiconductor lasers.
Identifiers: *Patent applications, PAT-CL-332-9-T.

The patent application relates to a circuit which shapes and amplifies a logic pulse to drive loads requiring high current levels such as light emitting diodes or semiconductor lasers. Automatic load protection and high speeds are provided by an inductor shunt within the circuit. The simplicity and lack of capacitors in the circuit make it ideal for gun fired applications such as optical telemetry.

PAT-APPL-589 160/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Voltage Ramp Temperature Controller.
Patent Application,
Paul Mikonis, Jr. Filed 23 Jun 75, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Temperature control, Patents, Thermocouples, Sweep generators, Voltage regulation, Circuits.
Identifiers: *Patent applications, PAT-CL-219-482.

The patent application describes a temperature control circuitry for use in detecting the temperature of a device for providing a programming voltage output for controlling a heating apparatus to vary the temperature of the device. The circuitry utilizes a thermocouple as a sensing element in conjunction with a sweep voltage generator and is capable of controlling the time required to heat the device, depending on its material, to a specific temperature over a wide range of temperature values. This is accomplished by superimposition of the thermocouple voltage of the device on a linear ramp voltage generated by the sweep voltage generator. The error signal produced is further processed to control the output of power supplied to heating elements in order that a linear temperature rise or fall of the heated device results over a predetermined elapsed time.

PATENT-3 898 578 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Integrable Power Gyrator.
Patent.
E. S. Hochmair. Patented 5 Aug 75, 11p PAT-APPL-361 666
Misc-Filed 18 May 1973 Supersedes N73-24236 (11 - 15, p 1756). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Gyrators, *Integrated circuits, *Power supply circuits, Circuit diagrams, *Patents, Transistor circuits.
Identifiers: PAT-CL-330-63.

A gyrator circuit is operated at high power levels of the conventional configuration of two amplifiers in a circular loop, one producing zero phase shift and the other producing 180 deg phase reversal. Two differential amplifiers are connected to the junction of two, complementary transistors so that output operation is class B. Each of the complementary transistors is connected to control two transistors in parallel, one of large conductive geometry and in a low resistance circuit and the other of small conductive geometry and in a resistance circuit. In a nonreciprocal embodiment, only the input port accommodates high power. Greatly increased efficiency is realized.

PATENT-3 899 745 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Isolated Output System for a Class D Switching-Mode Amplifier.
Patent.
M. A. Honnell. Patented 12 Aug 75, 8p PAT-APPL-464 723
Misc-Filed 26 Apr. 1974 Supersedes N74-21859 (12 - 13, p 1527). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Power amplifiers, *Signal processing, *Switching circuits, Alternating current, Direct current, *Patents, Pulse duration modulation, Transformers.
Identifiers: PAT-CL-330-207-A.

A class D amplifier for the amplification of signals having unipolar or bipolar direct current, or alternating current is described. Positive and negative signal channels and a transformer-coupled output circuit for each channel are included. A switching circuit which effects isolation of the non-operating channel from the operating channel as a function of signal polarity is also described.

PATENT-3 900 705 Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
Dual Digital Video Switcher.
Patent.
I. A. Richter. Patented 19 Aug 75, 16p PAT-APPL-400 467
Misc-Filed 25 Sep. 1973 Supersedes N73-32063 (11 - 23, p 2757).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Optical scanners, *Switching circuits, *Video data, Automatic control, Manual control, *Patents, Signal processing, Video equipment.
Identifiers: PAT-CL-178-6-8.

A system is described for manually and automatically coupling video signals from a plurality of cameras to a monitoring apparatus. The

system is comprised of a manual mode of operation, a continuous scan mode, a single scan mode, and a hold condition. The scanning mode is controlled by a shift register which is activated at various rates so as to vary the duration that a particular video signal is coupled to the monitoring apparatus. If the system is in the scan mode a push button can be depressed to hold the video signal coupled to the monitoring system until the operator desires to return to the scan cycle. Various logic circuits are utilized in the system for selecting a predetermined scanning sequence, as well as to permit the circuit to be manually operable under control of an operator.

SAND-75-5379 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Statistical Method for Test Sequence Evaluation.
G. R. Case. 1975, 10p CONF-750613-1

Descriptors: (*Integrated circuits, *Systems analysis), Randomness, Sequential circuits, Simulation, Statistical mechanics.

For abstract, see NSA 32 08, number 21802.

9F. Telemetry

AD-A016 052/3GA PC$10.25/MF$2.25
Range Commanders Council White Sands Missile Range N Mex Inter-Range Instrumentation Group
Test Methods for Telemetry Systems and Subsystems.
Jul 75, 397p Rept no. IRIG-118-73-Rev
Supersedes rept. no. RCC-118-73 dated May 73, AD-782 699. See also report dated 1973, AD-780 868.

Descriptors: *Telemeter systems, Guided missile ranges, Test methods, Calibration.

The document defines standard test methods for telemetry ground systems and related subsystems. Use of the methods as described in this document will enable the exchange of test results which are derived and expressed in a common manner. In addition, the performance characteristics will be a valuable aid in preventive maintenance and readiness evaluation. It is recommended that these methods be used as standards for determining telemetry system performance.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A015 974/9GA PC$5.25/MF$2.25
Science Applications Inc Arlington Va
Energy Demand and Resources of Japan. Volume I.
Final rept. Mar-Aug 73,
K. Dance, R. B. Ryan, and J. F. Schneider. Aug 73, 115p Rept no. SAI-73-550-AR-Vol-1 RADC-TR-74-39-Vol-1
Contract F30602-73-C-0159, ARPA Order-2339
See also Volume 2 dated Aug 73, AD-A015 975.

Descriptors: *Energy management, *Japan, History, Geopolitics, Forecasting, Coal, Natural gas, Fuel oil, Wood, Nuclear energy, Electric power production, Fuel consumption.
Identifiers: *Energy demand, Supply(Economics), Demand(Economics), Energy requirements, Hydroelectric power generation, Electric power demand.

Projections of Japan's energy demands through the year 2000 and potential sources of conflict that might arise as Japan attempts to secure her needed energy supplies are discussed. Potential areas of technology transfer to Japan which could have a stabilizing influence on the world energy situation are identified.

AD-A015 975/6GA PC$6.25/MF$2.25
Science Applications Inc Arlington Va
Energy Demand and Resources of Japan. Volume II.
Final rept. Mar-Aug 73,
K. Dance, B. Ryan, and J. F. Schneider. Aug 73, 158p Rept no. SAI-73-550-AR-Vol-2 RADC-TR-74-39-Vol-2
Contract F30602-73-C-0159, ARPA Order-2339
See also Volume 1 dated Aug 73, AD-A015 974.

Descriptors: *Energy management, *Japan, Electric power plants, Coal, Oils, Natural gas, Nuclear energy, History, Fuel consumption, Resources, Forecasting, International trade.
Identifiers: Hydroelectric power plants, Petroleum, Demand(Economics), Supply(Economics), Energy resources, Energy sources.

The five major energy resources of Japan (hydroelectric, coal, oil, gas, and nuclear power) are discussed in detail. Areas of demand, consumption, future prospects, and potential political problems are covered.

AD-A016 184/4GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Formulating a Pilot Model for Energy in Relation to the National Economy.
Technical rept.,
George B. Dantzig. Apr 75, 21p Rept no. SOL-75-10
Contracts N00014-75-C-0865, N00014-75-C-0267

Descriptors: *Energy management, *Linear programming, Mathematical models, Linear differential equations, Planning.
Identifiers: National planning and development.

This dynamic linear-programming model, on a pilot scale is an attempt to describe in physical terms many of the technological interactions within and across the sectors of the economy, including a detailed energy sector. The general objective of the model is to determine, in the face of changing energy picture, what the country can achieve in physical terms over the long term, say 30 years. Preliminary work on the pilot model indicates that it can be completed within six months and that several useful scenarios can be run during the ensuing six months.

N75-30645/6GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
Energy: A Continuing Bibliography with Indexes.
Technical Report, 1 Oct. - 31 Dec. 1974.
May 75, 228p NASA-SP-7043(04)

Descriptors: *Bibliographies, *Energy conservation, *Energy policy, Hydrogen-based energy, Solar energy, Windpower utilization.

For abstract, see STAR 1321

N75-30649/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Liquid-Metal Binary Cycles for Stationary Power.
M. Gutstein, E. R. Furman, and G. M. Kaplan.
Aug 75, 33p NASA-TN-D-7955, E-8023

Descriptors: *Electric power plants, *Liquid metals, *Rankine cycle, *Waste energy utilization, Boilers, Fossil fuels, Mercury (Metal), Nuclear power reactors, Potassium, Steam, Turbines.

For abstract, see STAR 1321

PB-245 159/9GA PC$9.50/MF$2.25
Portland Cement Association, Skokie, Ill.
Energy Conservation Potential in the Cement Industry.
Conservation paper.
Jun 75, 344p* FEA/D-75/400
Contract DI-14-01-0001-1858

Descriptors: *Energy consumption, *Fuel consumption, *Energy conservation, Portland cements, Kilns, Heat loss, Thermal efficiency, Energy requirements, History, Manufacturing, Economics, Industries, Japan, Europe, United States, Refractories.
Identifiers: *Cement industry, *Technology assessment, *Heat consumption, *Electric power consumption.

This study gives detailed background data needed to establish energy conservation objectives which are reasonable for the industry, to assess the potential for energy conservation within the industry, and to establish the probable impacts of certain levels and types of federal research, development, and demonstration support. It discusses basic materials, processes used in manufacturing, new technology available, and the controlling economics.

PB-245 172/2GA PC$5.25/MF$2.25
California Univ., Riverside. Inst. of Geophysics and Planetary Physics.
Proceedings: National Conference on Geothermal Energy Held on May 10-11, 1973 at Palm Springs, California. Volume I,
M. Leh, W. Elders, J. Combs, and T. Caplen. Aug 73, 110p NSF/RA/N-73-117A
Grant NSF-GI-36250
Paper copy also available in set of 2 reports as PB-245 171-SET, PC$11.00.

Descriptors: *Geothermal resources, *Meetings, Geothermal exploration, Leasing, Acquisition, Exploitation, Environmental impacts, Legislation, Availability, Regulations, Government policies, National government.

The primary focus of the conference was on an examination of the role of the various state and regulatory procedures affecting the area of geothermal resource development. Specifically, issues of possible overlapping of jurisdiction, confusion or, in some cases, seeming contradiction in governmental policies and requirements have been raised. This report brings together the major speeches and the panel groups' conclusions.

PB-245 173/0GA PC$7.25/MF$2.25
California Univ., Riverside. Inst. of Geophysics and Planetary Physics.
Proceedings: National Conference on Geothermal Energy Held on May 10-11, 1973 at Palm Springs, California. Volume II,
M. Leh, W. Elders, J. Combs, and T. Coplen.
Aug 73, 204p NSF/RA/N-73-117B
Grant NSF-GI-36250
Paper copy also available in set of 2 reports as PB-245 171-SET, PC$11.00.

Descriptors: *Geothermal resources, *Meetings, Public law, Administrative law, Exploitation, Legislation, Regulations, Leasing, Environmental impacts, Acquisition, Availability, Government policies, National government, State government, Local government, California, Flow charting.

Volume two contains the two background items prepared for consideration at the conference, in addition to eight documents pertaining to the statutory and legal aspects of the resource and its regulation. Covered are the interrelationship between federal, state, and local regulatory

agencies on the development of the geothermal resource in California, and a flow chart of critical path in geothermal explorations. Portions of this document are not fully legible.

PB-245 179/7GA PC$3.75/MF$2.25
Virginia Energy Office, Richmond.
Summary and Recommendations of the Final Report of the Electricity Costs Commission.
1 Jul 75, 45p VEO-75/03
Prepared by Electricity Costs Commission, Richmond, Va.

Descriptors: *Electric power, *Rates(Costs), Electric power demand, Supply(Economics), Demand(Economics), Electric utilities, Virginia, State government, Policies, Management.

The summary contains introductory remarks on the energy supply and demand picture and the complete recommendations of the commission. Background for these recommendations is contained in the full report.

PB-245 242/3GA PC$5.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Power and the Environment Planning Report.
Final rept.
Aug 75, 106p LISS-09
Report on Long Island Sound Study. Prepared by Federal Power Commission, New York. New York Regional Office.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Electric power demand, *Regional planning, *Energy requirements, *Long Island Sound, Electric power generation, Electric power plants, Electric utilities, Electric power production, Site selection, Environmental impacts, Forecasting, New York, Connecticut.
Identifiers: New England.

This planning report describes the power and environment element of the Long Island Sound Regional Study. It is part of the final report of the study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut.

PB-245 249/8GA PC$5.25/MF$2.25
Real Estate Research Corp., Chicago, Ill.
Energy, Land Use, and Growth Policy: Implications for Metropolitan Washington. Second Edition.
Final rept.,
James S. Roberts. Aug 75, 118p
Grant HUD-CPA-DC-1011

Descriptors: *Industries, *Management planning, *Meetings, *Productivity, Recommendations, Cost effectiveness, Automotive industry, Electrical industry, Problem solving, Machine tool industry, Gas appliances, Electric appliances, Food processing, Iron and steel industry.
Identifiers: Workshops.

Plans for a workshop to be held to obtain recommendations for the National Science Foundation on specific industrial productivity problems are outlined. Discussion and question and answer sessions will be aimed at formulating research projects or objectives that would aid productivity. For the workshop purpose, a definition of industrial productivity includes all actions contributing to industry-wide efficiency, total product cost, and production volume. Six industries, automotive, electrical machinery, machine tool, household appliances, food processing, and iron and steel, were selected for study. A list of problem areas and questions, researchable problem guidelines, and a list of questions for the industry participants are included. Detailed statements of suggested productivity problems submitted by a panel of academic and research experts selected to respond to industry representatives' statements are included in the appendix.

10B. Power Sources

AD-A015 769/3GA PC$5.25/MF$2.25
Std Research Corp Arcadia Calif
Nonlinear Loss Mechanisms in Advanced Magnetohydrodynamic Generators.
Final rept.,
S. T. Demetriades, C. D. Maxwell, E. D. Doss, D. A. Oliver, and G. S. Argyropoulos. 30 May 75, 113p Rept no. STD-75-013 AFOSR-TR-75-1432
Contract F44620-73-C-0001

Descriptors: *Magnetohydrodynamic generators, *Magnetohydrodynamics, Computerized simulation, Electrodes, Coatings, Electron energy, Thermochemistry, Mathematical models, Nonlinear systems.

Development of improved computer codes for solving the MHD problem has led to improved techniques for inverting the large matrixes that appear in the formulation and application of STD Research Corporation's direct solution of the electrical part of the MHD problem. Application of the STD Research MHD-generator-simulation computer codes to real MHD channels has verified the validity and accuracy of these codes by direct comparison with large-scale experiments. The influence of wall roughness on MHD channel performance has been studied theoretically and it has been found that roughness effects are calculable and in good agreement with experiments. A new phenomenon peculiar to MHD flows, electromagnetic roughness, has been discovered but its investigation was limited to qualitative predictions. The influence of electrode coatings, electron temperature elevation, thermochemistry and transport property changes in the boundary layer was investigated and it was concluded that most losses in MHD generators originate in the boundary layer and electrode voltage drops are calculable with high accuracy. Methods for significantly improving the performance and longevity of MHD generators by boundary layer and surface coating control were investigated theoretically and small-scale experiments for verifying these results are recommended.

AD-A015 840/2GA PC$3.75/MF$2.25
Simulation Physics Inc Burlington Mass
Stress Free Application of Glass Covers for Radiation Hardened Solar Cells and Arrays.
Interim rept. Jan 74-Jun 75,
Allen R. Kirkpatrick, and John A. Minnucci. Jun 75, 42p AFAPL-TR-75-54
Contract F33615-74-C-2001

Descriptors: *Solar cells, *Protective coatings, *Glass, Radiation effects, Humidity, Temperature, Thermal cycling tests, Vacuum ultraviolet radiation, Proton bombardment, Electron irradiation, Radiation hardening, Bonding, Spacecraft components.
Identifiers: *Silicon solar cells, Borosilicate glass.

This report describes the first sixteen months of a two and one half year program to develop a practical integral protective cover for silicon solar cells. The report discusses selection of Corning 7070 borosilicate glass as an optimum cover material and explains the mechanics of the electrostatic field-assisted bonding process used for cover application. Excellent results have been achieved for most solar cell types. Under environmental evaluations and electron and proton irradiation tests integrally covered cells exhibit performance statistically at least equal to that of cells with conventional glued covers.

AD-A015 880/8GA PC$7.00/MF$2.25
Hughes Aircraft Co El Segundo Calif Space and Communications Group
Reverse Current Blocking Diodes for Flexible Solar Array Protection.
Final rept. 2 Apr 73-14 Mar 75,
E. Levy, Jr., and R. J. McGrath. Apr 75, 247p
Rept no. SCG-50121R AFAPL-TR-75-23
Contract F33615-73-C-2060

Descriptors: *Solar panels, *Solar cells, *Semiconductor diodes, *Protective equipment, Flexible structures, Semiconductors, Silicon, Voltage, Direct current, Leakage(Electrical), Mirrors, Ionizing radiation.
Identifiers: *Blocking diodes, Reverse current, Mesa structures.

A unique Solar Cell Blocking Diode for use on solar panels is described. The device has the physical characteristics of a solar cell and the electrical properties of conventional diodes currently used for solar array reverse current isolation and protection. This combination of physical characteristics and electrical properties permits mounting of the diode on the panel surface in series with solar cells, and is particularly useful for flexible rollup solar arrays. The diode junction is diffused into a 1 x 2 cm, 8 mil thick, P-doped silicon blank. Nominal inverse voltage standoff characteristics of 140 volts at 1 mA leakage have been achieved with 20 ohm-cm base resistivity, 6 micrometer diffused junctions, and heavy silicon monoxide layers for surface passivation. Typical forward voltage drop at 0.3/3.0 amperes are of the order of 0.8/1.2 volts. Conventional diodes exhibit nominal inverse voltage standoff characteristics of 100 volts at 25 microamperes leakage, and typical forward voltage drop of 0.8/1.0 volt at 0.3/3.0 amperes. (Author)

AD-A015 893/1GA PC$6.25/MF$2.25
Airesearch Mfg Co of Arizona Phoenix
Advanced Auxiliary Power Unit.
Final rept. 19 May 72-21 Oct 74,
L. W. Norman, D. F. Swenski, R. C. Clarke, H. P. Gorman, and J. M. McVaugh. Jul 75, 152p Rept no. 73-310408 AFAPL-TR-75-22
Contract F33615-72-C-1936
See also report dated Nov 72, AD-754 903.

Descriptors: *Aircraft equipment, *Power supplies, *Centrifugal compressors, *Auxiliary power plants, Axial flow compressors, Gas turbines, Thermodynamic cycles, Ducts, Combustors.

The program propose was to convert the Auxiliary Power Unit (APU) portion of the Advanced Auxiliary Power System to an all shaft power configuration, by redesigning the compressor section, but without making any changes to the turbine, combustor, or other components previously developed under the aforementioned contract. The length, diameter and approximate speed of the APU developed under the previous contract were maintained throughout the program. The performance goal was 155 net shaft horsepower output at an average turbine inlet temperature of 2000F and at ambient conditions of 130F and sea level static pressure.

AD-A015 954/1GA PC$4.75/MF$2.25
Naval Academy Annapolis Md
Ocean Thermal Energy Conversion: A Model Approach.
Research rept.,
Thomas W. Frey. 22 May 75, 87p Rept no. USNA-TSPR-66
Report on a Trident Scholar Project.

Descriptors: *Electric power production, *Sea water, Oceans, Tropical regions, Energy conversion, Aluminum, Heat exchangers, Heat sinks, Rankine cycle, Refrigerants, Turbogenerators, Pressure, Cooling, Heating, Feasibility studies, Model tests, Electric power plants.

system is comprised of a manual mode of operation, a continuous scan mode, a single scan mode, and a hold condition. The scanning mode is controlled by a shift register which is activated at various rates so as to vary the duration that a particular video signal is coupled to the monitoring apparatus. If the system is in the scan mode a push button can be depressed to hold the video signal coupled to the monitoring system until the operator desires to return to the scan cycle. Various logic circuits are utilized in the system for selecting a predetermined scanning sequence, as well as to permit the circuit to be manually operable under control of an operator.

SAND-75-5379 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Statistical Method for Test Sequence Evaluation.
G. R. Case. 1975, 10p CONF-750613-1

Descriptors: (*Integrated circuits, *Systems analysis), Randomness, Sequential circuits, Simulation, Statistical mechanics.

For abstract, see NSA 32 08, number 21802.

9F. Telemetry

AD-A016 052/3GA PC$10.25/MF$2.25
Range Commanders Council White Sands Missile Range N Mex Inter-Range Instrumentation Group
Test Methods for Telemetry Systems and Subsystems.
Jul 75, 397p Rept no. IRIG-118-73-Rev
Supersedes rept. no. RCC-118-73 dated May 73, AD-782 699. See also report dated 1973, AD-780 868.

Descriptors: *Telemeter systems, Guided missile ranges, Test methods, Calibration.

The document defines standard test methods for telemetry ground systems and related subsystems. Use of the methods as described in this document will enable the exchange of test results which are derived and expressed in a common manner. In addition, the performance characteristics will be a valuable aid in preventive maintenance and readiness evaluation. It is recommended that these methods be used as standards for determining telemetry system performance.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A015 974/9GA PC$5.25/MF$2.25
Science Applications Inc Arlington Va
Energy Demand and Resources of Japan. Volume I.
Final rept. Mar-Aug 73,
K. Dance, R. B. Ryan, and J. F. Schneider. Aug 73, 115p Rept no. SAI-73-550-AR-Vol-1 RADC-TR-74-39-Vol-1
Contract F30602-73-C-0159, ARPA Order-2339
See also Volume 2 dated Aug 73, AD-A015 975.

Descriptors: *Energy management, *Japan, History, Geopolitics, Forecasting, Coal, Natural gas, Fuel oil, Wood, Nuclear energy, Electric power production, Fuel consumption.
Identifiers: *Energy demand, Supply(Economics), Demand(Economics), Energy requirements, Hydroelectric power generation, Electric power demand.

Projections of Japan's energy demands through the year 2000 and potential sources of conflict that might arise as Japan attempts to secure her needed energy supplies are discussed. Potential areas of technology transfer to Japan which could have a stabilizing influence on the world energy situation are identified.

AD-A015 975/6GA PC$6.25/MF$2.25
Science Applications Inc Arlington Va
Energy Demand and Resources of Japan. Volume II.
Final rept. Mar-Aug 73,
K. Dance, B. Ryan, and J. F. Schneider. Aug 73, 158p Rept no. SAI-73-550-AR-Vol-2 RADC-TR-74-39-Vol-2
Contract F30602-73-C-0159, ARPA Order-2339
See also Volume 1 dated Aug 73, AD-A015 974.

Descriptors: *Energy management, *Japan, Electric power plants, Coal, Oils, Natural gas, Nuclear energy, History, Fuel consumption, Resources, Forecasting, International trade.
Identifiers: Hydroelectric power plants, Petroleum, Demand(Economics), Supply(Economics), Energy resources, Energy sources.

The five major energy resources of Japan (hydroelectric, coal, oil, gas, and nuclear power) are discussed in detail. Areas of demand, consumption, future prospects, and potential political problems are covered.

AD-A016 184/4GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Formulating a Pilot Model for Energy in Relation to the National Economy.
Technical rept.,
George B. Dantzig. Apr 75, 21p Rept no. SOL-75-10
Contracts N00014-75-C-0865, N00014-75-C-0267

Descriptors: *Energy management, *Linear programming, Mathematical models, Linear differential equations, Planning.
Identifiers: National planning and development.

This dynamic linear-programming model, on a pilot scale is an attempt to describe in physical terms many of the technological interactions within and across the sectors of the economy, including a detailed energy sector. The general objective of the model is to determine, in the face of changing energy picture, what the country can achieve in physical terms over the long term, say 30 years. Preliminary work on the pilot model indicates that it can be completed within six months and that several useful scenarios can be run during the ensuing six months.

N75-30645/6GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
Energy: A Continuing Bibliography with Indexes.
Technical Report, 1 Oct. - 31 Dec. 1974.
May 75, 228p NASA-SP-7043(04)

Descriptors: *Bibliographies, *Energy conservation, *Energy policy, Hydrogen-based energy, Solar energy, Windpower utilization.

For abstract, see STAR 1321

N75-30649/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Liquid-Metal Binary Cycles for Stationary Power.
M. Gutstein, E. R. Furman, and G. M. Kaplan.
Aug 75, 33p NASA-TN-D-7955, E-8023

Descriptors: *Electric power plants, *Liquid metals, *Rankine cycle, *Waste energy utilization, Boilers, Fossil fuels, Mercury (Metal), Nuclear power reactors, Potassium, Steam, Turbines.

For abstract, see STAR 1321

PB-245 159/9GA PC$9.50/MF$2.25
Portland Cement Association, Skokie, Ill.
Energy Conservation Potential in the Cement Industry.
Conservation paper.
Jun 75, 344p* FEA/D-75/400
Contract DI-14-01-0001-1858

Descriptors: *Energy consumption, *Fuel consumption, *Energy conservation, Portland cements, Kilns, Heat loss, Thermal efficiency, Energy requirements, History, Manufacturing, Economics, Industries, Japan, Europe, United States, Refractories.
Identifiers: *Cement industry, *Technology assessment, *Heat consumption, *Electric power consumption.

This study gives detailed background data needed to establish energy conservation objectives which are reasonable for the industry, to assess the potential for energy conservation within the industry, and to establish the probable impacts of certain levels and types of federal research, development, and demonstration support. It discusses basic materials, processes used in manufacturing, new technology available, and the controlling economics.

PB-245 172/2GA PC$5.25/MF$2.25
California Univ., Riverside. Inst. of Geophysics and Planetary Physics.
Proceedings: National Conference on Geothermal Energy Held on May 10-11, 1973 at Palm Springs, California. Volume I,
M. Leh, W. Elders, J. Combs, and T. Caplen. Aug 73, 110p NSF/RA/N-73-117A
Grant NSF-GI-36250
Paper copy also available in set of 2 reports as PB-245 171-SET, PC$11.00.

Descriptors: *Geothermal resources, *Meetings, Geothermal exploration, Leasing, Acquisition, Exploitation, Environmental impacts, Legislation, Availability, Regulations, Government policies, National government.

The primary focus of the conference was on an examination of the role of the various state and regulatory procedures affecting the area of geothermal resource development. Specifically, issues of possible overlapping of jurisdiction, confusion or, in some cases, seeming contradiction in governmental policies and requirements have been raised. This report brings together the major speeches and the panel groups' conclusions.

PB-245 173/0GA PC$7.25/MF$2.25
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Proceedings: National Conference on Geothermal Energy Held on May 10-11, 1973 at Palm Springs, California. Volume II,
M. Leh, W. Elders, J. Combs, and T. Coplen.
Aug 73, 204p NSF/RA/N-73-117B
Grant NSF-GI-36250
Paper copy also available in set of 2 reports as PB-245 171-SET, PC$11.00.

Descriptors: *Geothermal resources, *Meetings, Public law, Administrative law, Exploitation, Legislation, Regulations, Leasing, Environmental impacts, Acquisition, Availability, Government policies, National government, State government, Local government, California, Flow charting.

Volume two contains the two background items prepared for consideration at the conference, in addition to eight documents pertaining to the statutory and legal aspects of the resource and its regulation. Covered are the interrelationship between federal, state, and local regulatory

agencies on the development of the geothermal resource in California, and a flow chart of critical path in geothermal explorations. Portions of this document are not fully legible.

PB-245 179/7GA PC$3.75/MF$2.25
Virginia Energy Office, Richmond.
Summary and Recommendations of the Final Report of the Electricity Costs Commission.
1 Jul 75, 45p VEO-75/03
Prepared by Electricity Costs Commission, Richmond, Va.

Descriptors: *Electric power, *Rates(Costs), Electric power demand, Supply(Economics), Demand(Economics), Electric utilities, Virginia, State government, Policies, Management.

The summary contains introductory remarks on the energy supply and demand picture and the complete recommendations of the commission. Background for these recommendations is contained in the full report.

PB-245 242/3GA PC$5.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Power and the Environment Planning Report.
Final rept.
Aug 75, 106p LISS-09
Report on Long Island Sound Study. Prepared by Federal Power Commission, New York. New York Regional Office.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Electric power demand, *Regional planning, *Energy requirements, *Long Island Sound, Electric power generation, Electric power plants, Electric utilities, Electric power production, Site selection, Environmental impacts, Forecasting, New York, Connecticut.
Identifiers: New England.

This planning report describes the power and environment element of the Long Island Sound Regional Study. It is part of the final report of the study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut.

PB-245 249/8GA PC$5.25/MF$2.25
Real Estate Research Corp., Chicago, Ill.
Energy, Land Use, and Growth Policy: Implications for Metropolitan Washington. Second Edition.
Final rept.,
James S. Roberts. Aug 75, 118p
Grant HUD-CPA-DC-1011

Descriptors: *Industries, *Management planning, *Meetings, *Productivity, Recommendations, Cost effectiveness, Automotive industry, Electrical industry, Problem solving, Machine tool industry, Gas appliances, Electric appliances, Food processing, Iron and steel industry.
Identifiers: Workshops.

Plans for a workshop to be held to obtain recommendations for the National Science Foundation on specific industrial productivity problems are outlined. Discussion and question and answer sessions will be aimed at formulating research projects or objectives that would aid productivity. For the workshop purpose, a definition of industrial productivity includes all actions contributing to industry-wide efficiency, total product cost, and production volume. Six industries, automotive, electrical machinery, machine tool, household appliances, food processing, and iron and steel, were selected for study. A list of problem areas and questions, researchable problem guidelines, and a list of questions for the industry participants are included. Detailed statements of suggested productivity problems submitted by a panel of academic and research experts selected to respond to industry representatives' statements are included in the appendix.

10B. Power Sources

AD-A015 769/3GA PC$5.25/MF$2.25
Std Research Corp Arcadia Calif
Nonlinear Loss Mechanisms in Advanced Magnetohydrodynamic Generators.
Final rept.,
S. T. Demetriades, C. D. Maxwell, E. D. Doss, D. A. Oliver, and G. S. Argyropoulos. 30 May 75, 113p Rept no. STD-75-013 AFOSR-TR-75-1432
Contract F44620-73-C-0001

Descriptors: *Magnetohydrodynamic generators, *Magnetohydrodynamics, Computerized simulation, Electrodes, Coatings, Electron energy, Thermochemistry, Mathematical models, Nonlinear systems.

Development of improved computer codes for solving the MHD problem has led to improved techniques for inverting the large matrixes that appear in the formulation and application of STD Research Corporation's direct solution of the electrical part of the MHD problem. Application of the STD Research MHD-generator-simulation computer codes to real MHD channels has verified the validity and accuracy of these codes by direct comparison with large-scale experiments. The influence of wall roughness on MHD channel performance has been studied theoretically and it has been found that roughness effects are calculable and in good agreement with experiments. A new phenomenon peculiar to MHD flows, electromagnetic roughness, has been discovered but its investigation was limited to qualitative predictions. The influence of electrode coatings, electron temperature elevation, thermochemistry and transport property changes in the boundary layer was investigated and it was concluded that most losses in MHD generators originate in the boundary layer and electrode voltage drops are calculable with high accuracy. Methods for significantly improving the performance and longevity of MHD generators by boundary layer and surface coating control were investigated theoretically and small-scale experiments for verifying these results are recommended.

AD-A015 840/2GA PC$3.75/MF$2.25
Simulation Physics Inc Burlington Mass
Stress Free Application of Glass Covers for Radiation Hardened Solar Cells and Arrays.
Interim rept. Jan 74-Jun 75,
Allen R. Kirkpatrick, and John A. Minnucci. Jun 75, 42p AFAPL-TR-75-54
Contract F33615-74-C-2001

Descriptors: *Solar cells, *Protective coatings, *Glass, Radiation effects, Humidity, Temperature, Thermal cycling tests, Vacuum ultraviolet radiation, Proton bombardment, Electron irradiation, Radiation hardening, Bonding, Spacecraft components.
Identifiers: *Silicon solar cells, Borosilicate glass.

This report describes the first sixteen months of a two and one half year program to develop a practical integral protective cover for silicon solar cells. The report discusses selection of Corning 7070 borosilicate glass as an optimum cover material and explains the mechanics of the electrostatic field-assisted bonding process used for cover application. Excellent results have been achieved for most solar cell types. Under environmental evaluations and electron and proton irradiation tests integrally covered cells exhibit performance statistically at least equal to that of cells with conventional glued covers.

AD-A015 880/8GA PC$7.00/MF$2.25
Hughes Aircraft Co El Segundo Calif Space and Communications Group
Reverse Current Blocking Diodes for Flexible Solar Array Protection.
Final rept. 2 Apr 73-14 Mar 75,
E. Levy, Jr., and R. J. McGrath. Apr 75, 247p
Rept no. SCG-50121R AFAPL-TR-75-23
Contract F33615-73-C-2060

Descriptors: *Solar panels, *Solar cells, *Semiconductor diodes, *Protective equipment, Flexible structures, Semiconductors, Silicon, Voltage, Direct current, Leakage(Electrical), Mirrors, Ionizing radiation.
Identifiers: *Blocking diodes, Reverse current, Mesa structures.

A unique Solar Cell Blocking Diode for use on solar panels is described. The device has the physical characteristics of a solar cell and the electrical properties of conventional diodes currently used for solar array reverse current isolation and protection. This combination of physical characteristics and electrical properties permits mounting of the diode on the panel surface in series with solar cells, and is particularly useful for flexible rollup solar arrays. The diode junction is diffused into a 1 x 2 cm, 8 mil thick, P-doped silicon blank. Nominal inverse voltage standoff characteristics of 140 volts at 1 mA leakage have been achieved with 20 ohm-cm base resistivity, 6 micrometer diffused junctions, and heavy silicon monoxide layers for surface passivation. Typical forward voltage drop at 0.3/3.0 amperes are of the order of 0.8/1.2 volts. Conventional diodes exhibit nominal inverse voltage standoff characteristics of 100 volts at 25 microamperes leakage, and typical forward voltage drop of 0.8/1.0 volt at 0.3/3.0 amperes. (Author)

AD-A015 893/1GA PC$6.25/MF$2.25
Airesearch Mfg Co of Arizona Phoenix
Advanced Auxiliary Power Unit.
Final rept. 19 May 72-21 Oct 74,
L. W. Norman, D. F. Swenski, R. C. Clarke, H. P. Gorman, and J. M. McVaugh. Jul 75, 152p Rept no. 73-310408 AFAPL-TR-75-22
Contract F33615-72-C-1936
See also report dated Nov 72, AD-754 903.

Descriptors: *Aircraft equipment, *Power supplies, *Centrifugal compressors, *Auxiliary power plants, Axial flow compressors, Gas turbines, Thermodynamic cycles, Ducts, Combustors.

The program propose was to convert the Auxiliary Power Unit (APU) portion of the Advanced Auxiliary Power System to an all shaft power configuration, by redesigning the compressor section, but without making any changes to the turbine, combustor, or other components previously developed under the aforementioned contract. The length, diameter and approximate speed of the APU developed under the previous contract were maintained throughout the program. The performance goal was 155 net shaft horsepower output at an average turbine inlet temperature of 2000F and at ambient conditions of 130F and sea level static pressure.

AD-A015 954/1GA PC$4.75/MF$2.25
Naval Academy Annapolis Md
Ocean Thermal Energy Conversion: A Model Approach.
Research rept.,
Thomas W. Frey. 22 May 75, 87p Rept no. USNA-TSPR-66
Report on a Trident Scholar Project.

Descriptors: *Electric power production, *Sea water, Oceans, Tropical regions, Energy conversion, Aluminum, Heat exchangers, Heat sinks, Rankine cycle, Refrigerants, Turbogenerators, Pressure, Cooling, Heating, Feasibility studies, Model tests, Electric power plants.

Identifiers: *Ocean thermal energy conversion, OTEC(Ocean Thermal Energy Conversion), R-11 refrigerant, Solar sea power plants.

An Ocean Thermal Energy conversion model was successfully built and it has demonstrated the feasibility of power generation from small temperature differences similar to those existing in the tropical oceans. Seventy watts of electrical power were generated at a pressure different of .32 psi, corresponding to an 11 F internal temperature differential. The model, the proceedings and details are described in the work.

AD-A016 123/2GA PC$3.75/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
Performance Evaluation of a Fused-Alkali Electrolyte, Internal-Reforming Fuel Cell.
Final rept.,
Edward J. Taborek. Apr 75, 32p Rept no. USAMERDC-2142

Descriptors: *Fuel cells, Performance tests, Hydrocarbons, Hydroxides, Corrosion, Nickel, Cathodes, Electrolytes, Anodes, Catalysts, Transition metal compounds, Oxides, Reliability(Electronics), Methane.
Identifiers: *Alkalies, Transition metal oxides, Fuel cell electrolytes, Hydrocarbon molten alkali fuel cells.

A fuel cell system using a molten hydroxide electrolyte, a nickel cathode, and a reforming anode with a 67 sq cm palladium membrane was purchased and tested. The system, operating at 500C, produced about 8 watts from hydrogen, methane, and UDEX-raffinate fuels but appears to achieve significant lifetime under only a narrow range of operating conditions. Procedures for startup, operation, and shutdown were developed.

AD-A016 223/0GA PC$4.25/MF$2.25
Uop Inc des Plaines Ill
Carbonsceous Catalysts for H3PO4 Fuel Cells.
Final technical rept.,
L. B. Welsh, R. W. Leyerle, G. L. Hervert, and K. J. Youtsey. Sep 75, 64p
Contract DAAK02-75-C-0011
See also report dated Mar 75, AD-A012 283.

Descriptors: *Electrocatalysts, Fuel cells, Phosphoric acids, Composite materials, Refractory materials, Polymers, Platinum, Catalysts, Supports, Substrates.
Identifiers: *Fuel cell catalysts, *Fuel cell electrodes, Kocite composites.

Kocite (trade mark) materials have been evaluated as low cost air and/or fuel electrocatalysts in phosphoric acid electrolyte fuel cells. Kocite materials are composite structures consisting of pyropolymers chemically bonded to refractory substrates. Fuel cell electrodes were fabricated and tested as anodes or cathodes in model fuel cells with conventional Pt fuel electrodes as counter electrodes. The research efforts have been divided into two parts. First, the performance of Kocite materials as electrocatalysts has been studied. The bulk of the program has been directed toward evaluating the performance of Kocite materials as platinum catalyst supports.

GEPP-173 PC$7.25/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
Theoretical Analysis of Heat Transfer in, and Electrical Performance of, a Milliwatt Radioisotopic Powered Thermoelectric Generator.
C. J. Biver. 22 Jul 75, 83p
Contract E(29-2)-656

Descriptors: (*Thermoelectric generators, *Heat transfer), Mathematical models, Performance, Radioisotope batteries, Simulation.

For abstract, see NSA 32 08, number 19531.

N75-30438/6GA PC$7.00/MF$2.25
Duke Univ., Durham, N.C. Dept. of Electrical Engineering.
Design of Energy Storage Reactors for DC-to-DC Converters.
Ph.D. Thesis.
D. Y. Chen. 18 Aug 75, 188p NASA-CR-143327
Contract NGL-34-001-001

Descriptors: *Computerized design, *Direct power generators, *Electric reactors, *Energy storage, Core storage, Design analysis, Digital computers, Energy transfer, Magnetic storage, Numerical analysis, Tables (Data).

For abstract, see STAR 1321

N75-30650/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Interim Solar Cell Testing Procedures for Terrestrial Applications.
H. Brandhorst, J. Hickey, H. Curtis, and E. Ralph. 1975, 19p NASA-TM-X-71771, E-8421

Descriptors: *Manufacturing, *Solar cells, *Standards, *Tests, Calibrating, Quality control, Test equipment.

For abstract, see STAR 1321

PAT-APPL-482 980/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Fuel Cell Using Lithium-Aluminum Alloy Anode and Aqueous Electrolyte.
Patent Application,
Herman B. Urbach, David E. Icenhower, Mark C. Cervi, and Robert J. Bower. Filed 25 Jun 74, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fuel cells, *Anodes, Patents, Lithium alloys, Aluminum alloys, Sea water.
Identifiers: *Patent applications, PAT-CL-136-120-FC.

The patent application concerns an electrochemical fuel cell exhibiting high specific power and specific energy in combination which comprises an aluminum-lithium alloy anode with an aqueous electrolyte. The electrolyte may be the readily available seawater circulated through the cell at a predetermined flowrate to obtain maximum controlled electrical energy output.

PAT-APPL-492 314/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Flux-Switched Inductor Alternator.
Patent Application,
Donald B. Steen. Filed 26 Jul 74, 21p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Alternators, Patents, Electric coils, Switching, Leakage(Electrical), Electric propulsion, Marine propulsion.
Identifiers: *Patent applications, PAT-CL-310-168, AC generators.

The patent application relates to an inductor alternator which is provided with a solid cylindrical iron rotor having at least one radially toothed portion. The stator is formed of a plurality of simply fabricated laminated bars arranged concentrically of the rotor axis is oppositely disposed pairs. The stator bars are each provided with inwardly extending radial projections confronting each toothed portion of the rotor. An elongated solenoidal field coil is arranged concentrically of the rotor and in close proximity thereto.

PAT-APPL-588 914/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
PbS-Al Selective Solar Absorber.
Patent Application,
Thomas J. McMahon, and Arnold K. Green.
Filed 20 Jun 75, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Optical filters, *Lead sulfides, *Aluminum, Patents, Solar collectors, Optical coatings.
Identifiers: *Solar energy absorbers, *Patent applications, PAT-CL-136-207.

The patent application concerns a solar absorber comprising a 1000 to 1500 A thick layer of lead sulfide on a thermally conductive base such as Al or Al-coated Cu. The solar absorber reflects on the order of 97% of the infrared while absorbing between 90 and 95% of the solar radiation band.

PATENT-3 899 696 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
Electric Power Generation System Directory from Laser Power.
Patent.
K. Shimada. Patented 12 Aug 75, 7p PAT-APPL-455 165
Misc-Filed 27 Mar. 1974 Supersedes N74-19702 (12 - 11, p 1250). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Cesium vapor, *Electric generators, *Energy conversion, *Laser heating, *Thermionic converters, Electric power supplies, Free electrons, Ionization potentials, Liquid metals, *Patents.
Identifiers: PAT-CL-310-4.

A pool of liquid cesium is spaced apart from a collector in an enclosed vessel. A laser beam is directed to the liquid cesium pool. The beam is focused to provide sufficient laser power density at the liquid cesium surface to vaporize some of the liquid cesium and ionize the vaporized cesium, and thereby form cesium ions and free electrons. The work function of the collector is different from that of cesium. When the work function is higher, the formed ions are attracted to the collector, and the electrons are attracted by the liquid cesium. Electrons and ions are attracted by the collector and liquid cesium respectively when the work function of the collector is less than that of cesium. Thus, a potential difference is generated by the liquid cesium pool and the collector, sufficient to apply electric power to a load.

PB-245 007/0GA PC$5.25/MF$2.25
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
Continuous Silicon Solar Cells.
Annual progress rept. 1 Oct-31 Dec 73,
B. Chalmers, T. Surek, A. I. Mlavsky, D. N. Jewett, and J. C. Swartz. Jan 74, 108p
NSF/RANN/SE/GI-37067X/PR/73/4
NSF/RA/N-74-010
Grant NSF-GI-37067

Descriptors: *Silicon solar cells, *Crystal growth, Single crystals, Design, Dies, Fabrication.
Identifiers: Ribbons(Crystals).

This report describes research on the application of the Edge-defined, Film fed growth (EFG) crystal growth technique to the continuous

growth of single crystal silicon ribbons from the melt. A detailed theoretical treatment of the problem of edge-definition, i.e. the relationship of the crystal geometry to the system and the growth parameters, is presented. The theoretical analyses are used in the design of the various system components and in the establishment of acceptable growth conditions. An analysis of the die material pans of using partially wetting dies of quartz, and in controlling the thermal environment for systems using carbon dies are described. The results of ribbon growth experiments and of solar cell fabrications are presented.

PB-245 115/1GA PC$7.00/MF$2.25
Electric Power Research Inst., Palo Alto, Calif.
Conference Proceedings: Fuel Cell Catalysis Workshop, Held at Palo Alto, California, on January 15-17, 1975.
Arnold Fickett. Aug 75, 188p* EPRI-SR-13

Descriptors: *Fuel cells, *Catalysis, Meetings, Anodes, Cathodes, Oxygen, Oxides, Carbon, Semiconductors, Electrochemistry, Questionnaires, Electric power generation, Temperature, Hydrocarbons.

Contents: Overview - (participants, questionnaire response); Purpose and objectives of the workshop; Fuel cell electrocatalyst considerations; Inhibition of sintering in supported fuel cell catalysts; Low temperature fuel cells - I - (Oxygen electrode kinetics on various electrode surfaces; Oxygen reduction below 200C; The role of oxides on the electroreduction of oxygen on noble metals); Low temperature fuel cells - II- (Spillover effects on supported fuel cell catalysts; carbon electrodes; Direct hydrocarbon electrocatalysis; High temperature fuel cell: role of catalysts; New concepts/techniques.

PB-245 157/3GA PC$9.50/MF$2.25
Mitre Corp., McLean, Va.
Proceedings of Legal and Institutional Problems of Electrical Facility Siting Workshop, Held at the Mitre Corporation, McLean, Virginia on February 27-28, 1975.
Jun 75, 327p* MTR-6943
Contract NSF-C925

Descriptors: *Electric power plants, *Site surveys, *Meetings, Planning, Electric utilities, Land use, Legislation, Electric power generation, Management planning, Regulations.

The document contains edited transcripts of the presentations and discussion at a Workshop on Legal and Institutional Problems of Electrical Facility Siting held at The MITRE Corporation in McLean, Virginia on February 27 and 28, 1975. The purpose of the workshop, sponsored by the National Science Foundation, was to rank issues and identify areas requiring further research and development. The presentations addressed the current structures and problems of electrical facility siting, alternative solutions, and the impacts of utility problems on the consumer.

PB-245 216/7GA PC$3.75/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Coal.
Demand for Coal for Electricity Generation 1975-1984.
Final rept.
Aug 75, 40p* FEA/G-75/487
Prepared by ICF, Inc., Washington, D.C.

Descriptors: *Electric utilities, *Electric power generation, *Fuel consumption, *Coal, Energy demand, Energy requirements, Production capacity, Forecasting, Trends, Planning, Electricity, Natural gas, Fuel oil, Nuclear energy.
Identifiers: Fuel demand.

This report compiles data submitted by the Regional Electric Councils and relates to the status of their respective Bulk Power Supply Programs to the Federal Power Commission. These data include projections of annual net generation requirements and scheduled generating capacity additions by primary fuel type through 1984 as well as detailed information on individual existing generating units including megawatt capacities and both primary and alternative fuel types.

PB-245 220/9GA PC$4.75/MF$2.25
Mitre Corp., McLean, Va.
Legal and Institutional Problems of Electrical Facility Siting.
Summary rept.,
B. Borko, W. deDufour, J. Just, and E. Roberts.
May 75, 95p MTR-6917
Contract NSF-C925

Descriptors: *Electric power plants, *Site surveys, *Meetings, Planning, Electric utilities, Land use, Legislation, Electric power generation, Regulations, Management planning.

The document summarizes the presentations and discussion at a workshop on Legal and Institutional Problems of Electrical Facility Siting held at the MITRE Corporation in McLean, Virginia on February 27 and 28, 1975. The purpose of the workshop, sponsored by the National Science Foundation, was to prioritize issues and identify areas requiring further research and development. The presentations addressed the current structures and problems of electrical facility siting, alternative solutions, and the impacts of utility problems on the consumer.

PB-245 264/7GA PC$6.25/MF$2.25
Bechtel, Inc., San Francisco, Calif.
Electric Power Generation Using Geothermal Brine Resources for a Proof-of-Concept Facility,
Frank A. Comprelli. May 75, 175p NSF/RA/N-75-049
Grant NSF-AER74-19931

Descriptors: *Geothermal power plants, *Hot water systems, *Geothermal energy conversion, Geothermal systems, Site selection, Planning, Design, Drawings, Cost estimates, Safety engineering, Environmental impacts, Pilot plants, Feasibility.

This study anticipates a proof-of-concept project to establish the technical, environmental, and economic feasibility of using hot brine resources for electric power production and other industrial applications. The report discusses site selection; energy conversion process evaluation; conceptual design; implementation plan and schedule; and capital cost estimate.

SAND-75-5674 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Multimegajoule Pulsed Power Generation from a Reusable Compressed Magnetic Field Device.
M. Cowan, E. C. Cnare, W. K. Tucker, and D. R. Wesenberg. 4p CONF-741163-2

Descriptors: (*Pulse generators, *Design), Combustion, Performance, Superconducting magnets, Switching circuits.

For abstract, see NSA 32 08, number 19584.

10C. Energy Storage

AD-A015 868/3GA PC$3.25/MF$2.25
Defence Research Establishment Ottawa (Ontario)
A Pressed-Sintered Silver Chloride Cathode,
P. J. Powell, and G. D. Nagy. Aug 75, 18p Rept no. DREO-724

Abstract in French.

Descriptors: *Electrodes, *Primary batteries, *Sea water batteries, *Reserve batteries, *Cathodes(Electrolytic cell), Metals, Silver chloride, Canada.
Identifiers: AN/URT-503, Magnesium silver chloride cells.

A new silver chloride electrode has been developed for use in metal-silver chloride batteries, capable of operating over a wide temperature range (-40 C to +145 C). The method of manufacturing such an electrode involves the use of a mixture containing 90% AgCl and 10% Ag20, which is pressed onto a silver grid and sintered. This report deals with some of the advantages of such an electrode as they are related to a low-rate battery application (2 mA/c sq cm). (Author)

AD-A015 892/3GA PC$8.75/MF$2.25
Magnetic Corp of America Waltham Mass
Design, Construction and Testing of a Pulsed High Energy Inductive Superconducting Energy Storage System.
Final rept. 1 Apr 71-4 Apr 75,
E. J. Lucas, W. F. B. Punchard, P. M. G. Margosian, R. J. Thome, and R. J. Camille. Sep 75, 291p Rept no. MCA-TR-WP10-2 AFAPL-TR-75-60
Contract F33615-71-C-1454
See also report dated Dec 72, AD-755 359.

Descriptors: *Energy storage, *Superconductors, Magnet coils, Electromagnetic induction, Dewar flasks, Losses, Power supplies, High energy, Pulses, Switching, Interrupters, Superconductivity.
Identifiers: Superconducting magnets, *Inductive energy storage.

Major problems associated with inductive energy storage systems operated at high repetition rates include: breaking high currents in inductive circuits; developing a low loss superconductor and from it building a coil which remains superconducting during the rapid charge period; and building a low heat leak non-conducting dewar. Theoretical analyses concerning conductor energy losses, transient heating effects, electrical circuits, and switch actuation, were conducted. To confirm these analyses experiments were conducted on model non-conducting dewars and 1 and 7 kJ stored energy model coils using a pneumatically actuated vacuum interrupter.

AD-A016 132/3GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
Investigation of Charging Methods for Nickel-Cadmium Batteries.
Technical rept.,
Otto C. Wagner, and Dorothy D. Williams. Sep 75, 16p Rept no. ECOM-4355

Descriptors: *Nickel cadmium batteries, Battery chargers, Electrochemistry, Control, Discharge, Performance(Engineering).

Sealed nickel-cadmium batteries, each battery consisting of five 4.0 Ah D cells manufactured by General Electric Company, showed little difference in charge acceptance between the pulse and constant current d.c. charging modes in a temperature range of -20F to about +100F. Above +100F maximum charge acceptance is attained at the 2C rate for both charge modes, while at temperatures below +40F the charge rate should be as low as C/10. Charge control by a pressure switch developed by General Research Laboratories proved to be highly pressure switch developed by General Research Laboratories proved to be highly practical for the sealed D-type nickel-cadmium batteries employed in this study. Memory, a phenomenon due to the formation of alpha-

type nickelic oxide in the nickel cathodes of vented nickeltcadmium batteries, can be erased by occasionally draining the battery to about O volt per cell at the C/10 rate.

ERDA-tr-35 PC$9.75/MF$2.25
Calculation, Comparison, and Optimization of the Magnet Systems of Superconducting Inductive Energy Storage Devices with Different Geometric Shapes.
S. A. Egorov, and A. I. Kostenko. 1974, 132p
CONF-741238-2
Translated by W.J. Grimes from Induktivnyye nakopiteli energii i kommutatsionnaya apparatura dlya termoyadernykh ustanovok.

Descriptors: (*Energy storage, Superconducting magnets), (*Superconducting magnets, *Design), Cost, Efficiency, Induction, Optimization, Shape.

For abstract, see NSA 32 08, number 19580.

N75-30512/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Battery Peak Charge Voltage Monitor for Dual Air Density Satellite.
T. A. Shull. 23 Jul 75, 10p NASA-TM-X-72669

Descriptors: *Electric batteries, *Satellite lifetime, *Spacecraft power supplies, Analog to digital converters, Data transmission, Electric potential, Integrated circuits, Thin films.

For abstract, see STAR 1321

N75-30647/2GA PC$7.00/MF$2.25
Pennsylvania Univ., Philadelphia. Dept. of Chemistry.
Fundamental Studies Connected with Electrochemical Energy Storage.
Final Report.
E. Buck, and R. Sen. 1974, 194p NASA-CR-143378
Contract NGL-39-010-002

Descriptors: *Electrochemistry, *Energy storage, *Storage batteries, Activation energy, Electron transfer, Kinetic energy, Proton energy, Quantum mechanics.

For abstract, see STAR 1321

N75-30651/4GA PC$3.25/MF$2.25
Naval Weapons Support Center, Crane, Ind. Weapons Quality Engineering Center.
Evaluation Program for Secondary Spacecraft Cells: Initial Evaluation Tests of Gulton Industries, Incorporated, 9.0 Ampere-Hour Nickel-Cadmium Spacecraft Cells with Auxiliary Electrodes for the Small Astronomy Satellite (Sas-C).
J. D. Harkness. 2 Jul 75, 18p NASA-CR-144666, WQEC/C-75-165
NASA ORDER S-53742-AG

Descriptors: *Nickel cadmium batteries, *Sas-c, *Spacecraft power supplies, Electric potential, Performance prediction, Performance tests, Tables (Data).

For abstract, see STAR 1321

N75-30652/2GA PC$3.25/MF$2.25
Naval Weapons Support Center, Crane, Ind.
Evaluation Program for Secondary Spacecraft Cells: Initial Evaluation Tests of General Electric Company 6.0 Ampere-Hour Nickel-Cadmium Spacecraft Cells for the Improved Tiros Operational Satellite (Itos).
J. D. Harkness. 1 Jul 75, 14p NASA-CR-144667, WQEC/C-75-164
NASA ORDER S-23404-G

Descriptors: *Auxiliary power sources, *Itos 1, *Nickel cadmium batteries, *Performance tests, Quality control, System failures, Tables (Data).

For abstract, see STAR 1321

PAT-APPL-451 621/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
An Improved Reserve Battery.
Patent Application,
William C. Merz. Filed 15 Mar 74, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Reserve batteries, Patents, Radio transmitters, Sea rescue equipment.
Identifiers: *Patent applications, PAT-CL-136-114.

The patent application disclosed concerns an improved reserve battery for providing electrical current when an unexpected need arises and in particular involves a battery container including four porous cells, a bellows including a solvent to energize the cells, means for separating the solvent and the cells until electricity is needed and a means for puncturing the separating means and mixing the solvent with the dry porous portion. Such a system is uniquely adaptable to safety equipment such as radio transmitters used in survival equipment at sea.

PAT-APPL-534 990/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
A Device for Determining the State of Charge in Batteries.
Patent Application,
Gerald E. McWilliams. Filed 20 Dec 74, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Test equipment, Electric batteries, Electric charge, Patents.
Identifiers: *Battery testers, *Patent applications, PAT-CL-324-29-5.

The patent application describes a device for determining the state of charge in batteries. The battery under test is discharged to its maximum capability by controlling the discharge current in a linear manner. The product of the current and battery voltage is recorded until the battery power reaches maximum at the maximum power point. The readings, peak power and the potential of the battery at the peak power, are held on meters by peak read and hold and track and hold circuits, respectively. From the readings obtained the state of charge can be determined by using a calibration curve for the type of battery being tested.

11. MATERIALS

11A. Adhesives and Seals

AD-A015 720/6GA PC$5.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Mechanical Engineering and Astronautical Sciences
Frictional Wear Mechanisms.
Annual rept. 1974-1975,
Aug 75, 103p Rept no. 5341-413
Contract N00014-67-A-0356-0022

Descriptors: *Seals(Stoppers), *Wear, Friction, Surfaces, Thermal instability, Sliding contacts, Films, Lubrication, Elastic properties.

The report summarizes three complementary studies of seal contact, where frictional heating can lead to distortion of the contacting surfaces. The first shows that contact shear stress has negligible effect in determining contact pressure. A critical-wear-rate measure is introduced. When actual wear rate exceeds the critical value stability of contact is assured and surface distortions tend to smooth out. The second assumes the surfaces have distorted to the point where they contact only at patches, and shows when such patches can exist, again demonstrating the role of critical wear rate. The third treats the case where a liquid film separates the surfaces showing that viscous heating can lead to surface-distortion instability. Introductory material is included, showing how the problem fits into the field of tribology, reviewing the development of the project and setting the problem in historical perspective.

AD-A015 802/2GA PC$4.75/MF$2.25
Dow Corning Corp Midland Mich
Dynamic and Static Evaluation of Experimental Integral Fuel Tank Sealant Materials.
Final rept. 1 May 72-31 Jul 74,
John H. Baker. Dec 74, 81p AFML-TR-74-245
Contract F33615-72-C-1594

Descriptors: *Fuel tanks, *Sealants, Test methods.
Identifiers: Chemical resistance, *Aircraft components.

This final technical report describes the investigation and evaluation of experimental integral fuel tank sealants under laboratory conditions simulating aircraft integral fuel tanks. Materials investigated were Dow Corning 77-028, 77-085, 3M Polyester, TRW Polyimide, Polysulfide and AFML Viton. These materials were evaluated dynamically in a fillet sealed configuration. This report also describes in detail the functions, operations and problems encountered with the dynamic test apparatus that has been designed and fabricated for the purpose of evaluating experimental aircraft integral fuel tank sealants. A portion of the effort was required to diagnose deficiencies and mechanical failures of the testing equipment which resulted in the lack of conclusive data in the report.

11B. Ceramics, Refractories, and Glasses

AD-A015 717/2GA PC$4.75/MF$2.25
Lehigh Univ Bethlehem Pa Ceramics Research Lab
Thermal Conductivity and Diffusivity of Engineering Ceramics.
Interim technical rept.,
J. E. Matta, J. H. Siebeneck, B. K. Ganguly, and D. P. H. Hasselman. Aug 75, 84p
Contract N00014-67-A-0370-0011

Descriptors: *Ceramic materials, *Thermal conductivity, *Thermal diffusion, Alumina, Thermal stresses, Heat transfer, Chromium compounds, Oxides, Titanates, Iron compounds, Cutting tools, Fracture(Mechanics), Wear resistance.
Identifiers: Iron titanates, Chromium oxides.

This report presents preprint of technical papers prepared during the research program to-date in the form of separate chapters, as follows: (1) Effect of temperature dependence of thermal conductivity on thermal stress resistance of brittle materials, in particular aluminum oxide; (2) Effect of matrix conductivity on radiation heat transfer across spherical pores; (3) The thermal diffusivity of Al2O3-Cr2O3 solid-solutions effect of micro-cracking on the thermal diffusivity of Fe2TiO5; (5) Role of thermal diffusivity in the performance of ceramic oxide cutting-tool materials.

AD-A015 873/3GA PC$3.75/MF$2.25
California Univ Los Angeles Dept of Materials
Synthesis of New Superhard Materials and their Application to Cutting Tools.
Semi-annual technical rept. no. 2, 1 Sep 74-31 Mar 75,

R. E. Bunshah, and A. H. Shabaik. Apr 75, 47p
Rept no. UCLA-ENG-7559 AFOSR-TR-75-1382
Contract F44620-74-C-0044, ARPA Order-2574

Descriptors: *Carbides, *Ceramic coatings, *Cermets, *Hardness, *Vapor deposition, *Cutting tools, Tool steel, Coatings, Ceramic materials, Synthesis(Chemistry), High velocity, Machining, Oxides, Nitrides.
Identifiers: *Activated reactive evaporation, *Superhard materials, Tantalum carbides, Tungsten carbides.

Two major areas of effort are encompassed: I. Synthesis of Superhard Materials: The process of Activated Reactive Evaporation is used to synthesize superhard materials like carbides, oxides, nitrides, ultrafine grain cermets. The deposits are characterized by hardness microstructure and lattice parameter measurements. The synthesis and characterization of various carbides in the Ta-C and W-C systems, and of TiC-Ni cermets is given. II. Study and the Effect of Superhard Coatings on the Performance of High Speed Steel Tools: Tools of different coating characteristics are tested for machining performance at different speeds and feeds. The machining evaluation and the selection of coatings is based on the rate of deterioration of the coating, tool temperature, and cutting forces. Tool life tests show coated high speed steel tools show a 300% improvement in tool life. (Author)

AD-A015 879/0GA PC$4.75/MF$2.25
National Materials Advisory Board (Nas-Nae) Washington D C
Structural Ceramics.
Final rept.
1975, 93p Rept no. NMAB-320
Contract MDA-903-74-C-0167

Descriptors: *Ceramic materials, *Structures, Thermal stability, Structural properties, Brittleness, Mechanical properties, Gas turbines, Bearings, Substitutes, Materials, Turbine parts, High temperature, Military applications, Research management, Military research, Naval research, State of the art, Silicon nitrides, Alumina.
Identifiers: Sialons.

The principal objective of this study was to evaluate the advances in the uses of ceramics as engineering load carrying structural materials and to make recommendations for support of future developments, particularly for the U.S. Department of Defense and the National Aeronautics and Space Administration, and generally for the nation as a whole. (Author)

AD-A016 129/9GA PC$3.75/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
Utilization of the Bend Test for Determining Tensile Properties of a Brittle Material.
Final rept.,
John Campo. Aug 75, 27p Rept no. AMMRC-TR-75-17

Descriptors: *Silicon nitrides, *Fracture(Mechanics), Test methods, Bending stress, Tensile stress, Weibull density functions, Tension, Probability density functions.
Identifiers: *Bend tests, Tension tests.

A limited number of bend as well as tension tests were performed at room temperature on specimens made of Norton HS-130 grade silicon nitride. By application of the two-parameter Weibull analysis for a material governed by volumetric flaw distribution, tensile properties of the specimen, based upon the data of both types of testing, were determined and compared. The results show, at least for the specimens tested, that the bend test tends to predict fracture stresses of the tension specimens approximately 8% higher than those obtained in the actual tension tests.

ARH-SA-213 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Production of Ceramic Grade Plutonium Dioxide.
C. M. Peabody, and P. C. Doto. Apr 75, 17p
CONF-750607-25
Contract AT(45-1)-2130

Descriptors: (*Plutonium dioxide, *Production), Calcination, Chemical preparation, Filtration, Materials handling, Nuclear fuels, Oxalates, Precipitation, Standards.

For abstract, see NSA 32 08, number 20202.

BNL-20253 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Radiation Induced Coloring of Glasses Measured During and after Electron Irradiation.
K. J. Swyler, W. H. Hardy, II, and P. W. Levy.
1975, 13p CONF-750703-13

Descriptors: (*Glass, *Physical radiation effects), (*Sodium silicates, Physical radiation effects), (*Lead silicates, Physical radiation effects), Absorption spectra, Color centers, Coloration, Dose rates, Electron beams, Kinetics, Mev range, Radiation doses, Time dependence.

For abstract, see NSA 32 08, number 20405.

CONF-750532-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Bioceramics and Carbon.
W. P. Eatherly. 10p
Contract W-7405-eng-26

Descriptors: (*Graphite, *Fabrication), (*Carbon, *Materials testing), (*Pyrolytic carbon, Materials testing), Anatomy, Biological materials, Ceramics, Design, Man, Mechanical properties, Physical properties.

For abstract, see NSA 32 08, number 20204.

CONF-750714-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Effects of Fast-Neutron Damage from 0 to 42 X 10 exp 21 Neutrons/cm exp 2 on the Physical Properties of Near-Isotropic Grades of Graphite.
W. H. Cook, C. R. Kennedy, and W. P. Eatherly.
1975, 5p

Descriptors: (*Graphite, *Physical radiation effects), Fast neutrons, Fractures, High temperature, Mechanical properties, Neutron beams, Shear properties, Strains, Thermal expansion, Thermal shock, Young modulus.

For abstract, see NSA 32 08, number 20406.

COO-2390-8 PC$4.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Materials Science and Engineering.
Firing: The Proof Test for Ceramic Processing.
W. D. Kingery. 1975, 22p CONF-750131-1
Contract AT(11-1)-2390

Descriptors: (*Ceramics, *Physical properties), Baking, Crystal structure, Defects, Diffusion, Grain size, Mechanical properties, Phase transformations, Porosity, Processing, Refractories, Sintering, Strains.

For abstract, see NSA 32 08, number 20205.

FRNC-TH-563 PC$7.75/MF$2.25
Toulouse-3 Univ., 31 (France).
Natural and exp 60 CO gamma Radiation-Induced Conduction of Silver-Activated Metaphosphate Glass.
A. Velompanahy. 1975, 93p
In French. U.S. Sales Only.

Descriptors: (*Glass, *Physical radiation effects), (*Phosphates, Physical radiation effects), (*Silver compounds, Physical radiation effects), Activation energy, Doped materials, Electric conductivity, Gamma radiation, Photon beams.

For abstract, see NSA 32 08, number 20408.

GERHTR-131 PC$4.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Changes in Dimensions, Modulus of Elasticity and Thermal Conductivity Due to Regraphitization Caused by Neutron Irradiation.
W. Delle. 26 Apr 74, 16p
Translation of a paper presented at spring meeting of the Carbon Working Party of the German Ceramics Society.

Descriptors: (*Graphite, *Physical radiation effects), Dimensions, Elasticity, Neutron beams, Order parameters, Thermal conductivity.

For abstract, see NSA 32 08, number 20409.

LA-5937-MS PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Thermal and Other Properties of Refractories.
D. T. Vier. Apr 75, 51p
Contract W-7405-eng-36

Descriptors: (*Refractories, *Thermodynamic properties), Boiling points, Data compilation, Enthalpy, Fusion heat, Melting points, Tables, Vaporization heat.

For abstract, see NSA 32 08, number 20192.

N75-30263/8GA PC$3.75/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Review on the Structure of Silicate Melts.
M. Kosaka, M. Kato, and I. Shiroyanagi. Sep 75, 31p NASA-TT-F-16540
Contract NASW-2790
Tran-Transl. Into English from Nagoya Kogyo Gijutsu Shikensho Hokoku (Japan), V. 22, No. 12, Dec. 1973 p 457-468.

Descriptors: *Chemical properties, *Melting, *Microstructure, *Silicates, Distribution functions, High temperature, Physical properties.
Identifiers: Translations.

For abstract, see STAR 1321

ORNL-TM-4504 PC$13.75/MF$2.25
Oak Ridge National Lab., Tenn.
Graphitization Kinetics of Fluidized-Bed Pyrolytic Carbons.
R. L. Beatty. Aug 75, 211p

Descriptors: (*Graphite, *Phase transformations), (*Pyrolytic carbon, Phase transformations), Crystal structure, Density, Diamagnetism, Fluidized bed, Heat treatments, Kinetics, Magnetic susceptibility, Methane, Microstructure, Propylene, Substrates, Temperature dependence.

For abstract, see NSA 32 08, number 20410.

SAND-75-0346 PC$5.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Mechanical Properties of Molybdenum-Sealing Glass-Ceramics.
J. C. Swearengen, and R. J. Eagan. Jul 75, 36p
Contract AT(29-1)-789

Descriptors: (*Glass, *Mechanical properties), (*Molybdenum, *Seals), (*Zinc silicates, Mechanical properties), Ceramics, Composite materials, Elasticity, Fracture properties, Microstructure, Thermal expansion.

For abstract, see NSA 32 08, number 20211.

SLA-74-0157 PC$5.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Compatibility of Dielectric and Heat Shield Material Combinations During Ablations.
K. E. Mead, R. E. Sheldahl, and G. F. Wright. Jul 75, 41p
Contract AT(29-1)-789

Descriptors: (*Microwave equipment, Thermal shields), (*Antennas, Thermal shields), (*Thermal shields, *Ablation), (*Boron nitrides, Ablation), Erosion, Mass transfer, Plastics, Reentry, Silicon oxides, Windows.

For abstract, see NSA 32 08, number 20212.

11C. Coating, Colorants, and Finishes

AD-A015 955/8GA PC$3.75/MF$2.25
Naval Academy Annapolis Md
The Inhibitory Effects of Obtusaquinone and Related Chemicals on the Wood-Boring Crustacean Limnoria.
Research rept.,
Frederick L. Goodwin. 22 May 75, 47p Rept no. USNA-TSPR-67
Report on a Trident Scholar Project.

Descriptors: *Quinones, *Wood, *Preservatives, *Protective treatments, *Marine borers, *Antifouling coatings, Biodeterioration, Test methods, Environmental tests, Salinity, Temperature, pH factor, Preservation.
Identifiers: Obtusaquinone, Limnoria Tuberculate, Limnoria quadripuncta, Limnoria tripuncta.

The writer conducted an experiment on the inhibitory effects of obtusaquinone on limnoria to find a new wood preservative. Three species were employed: Limnoria tuberculate; L. quadripunctata; and L. tripunctata. The panels were impregnated in a vacuum chamber by bleeding the aceton-dissolved solution into the chamber, then exposing to nitrogen gas under 100 pounds pressure for 1 hour. Panels were placed into 50-gallons aquariums with infested wood from Boston; Chatham, Mass.; and Marina Del Rey, Calif. Test parameters were: salinity, 31% + or - 1%; temperature, 20.0 C + or - 2.5 C; pH 7.8 + or - 0.1. Present in the tanks were source wood, test panels, solder braces, air stones, and one air filter. Test panels were removed from contact with the Massachusetts wood after 5 months - and from the California wood after 4 months of exposure. The new N.R.L. derivative of obtusaquinone was effective and resisted attack in all control tanks. Further research should be conducted and sponsored by the U.S. Navy with this new derivative in order to study its effect on other wood boring organisms as teredos and pholads, etc. (Author)

GA-A-13254 PC$4.25/MF$2.25
General Atomic Co., San Diego, Calif.
Preparation of Silicon Nitride Coatings by Ion Plating.
J. Chin, and N. B. Elsner. 9 Dec 75, 25p CONF-750234-1
Contract AT(04-3)-943

Descriptors: (*Silicon nitrides, *Deposition), (*Silicon alloys, *Surface coating), (*Molybdenum alloys, Surface coating), Glow discharges, N-type conductors, P-type conductors, Vapor plating.

For abstract, see NSA 32 08, number 20206.

N75-30302/4GA PC$3.25/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
Effect of the Structure and Thickness of Zinc Coatings on Their Corrosion in Hot Tap Water.
H. Leda, and Z. Szczepanski. 1975, 15p CSIR-TRANS-1214
Tran-Transl. Into English from Ochr. Koroz. (Warsaw), V. 17, No. 2, 1974, p 37-41.

Descriptors: *Corrosion resistance, *Protective coatings, *Zinc coatings, Crystal structure, Electrochemistry, Pipes (Tubes).
Identifiers: Translations.

For abstract, see STAR 1321

11D. Composite Materials

AD-A015 715/6GA PC$3.75/MF$2.25
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Engineering Science and Mechanics
The Effect of Frequency on the Fatigue Damage of Boron/Aluminum Fiber Reinforced Composite Materials.
Interim rept.,
R. S. Williams, K. L. Reifsnider, W. W. Stinchcomb, and H. N. Turgay. Oct 74, 44p
AFOSR-TR-75-1394
Grant AF-AFOSR-2358-72

Descriptors: *Fiber reinforced composites, Boron, Aluminum alloys, Fatigue(Mechanics), Fatigue tests(Mechanics).
Identifiers: *Boron reinforced composites, *Aluminum matrix composites.

The results of strain-controlled axial fatigue tests on boron/aluminum fiber reinforced composite materials are presented in the second of a series of reports detailing such results for a large number of fatigue tests run on boron/epoxy and boron/aluminum. Data from a series of undamaged (virgin) cyclic stress-strain tests at various frequencies and a series of constant strain amplitude fatigue tests at various frequencies is presented and discussed at length. Complete specimen and testing specifications are included. A difinitive relationship between damage and cyclic frequency is established for this material system, as was the case for the boron/epoxy system with substantially different material properties reported in the first report of this series.

AD-A015 727/1GA PC$3.75/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
Synthesis of Quinoxaline Polymers Curable by Intramolecular Cyclization.
Final technical rept. May 72-Sep 75,
Frederick L. Hedberg, and Fred E. Arnold. Jun 75, 30p Rept no. AFML-TR-74-278

Descriptors: *Polymers, *Synthesis(Chemistry), *Curing, *Thermal stability, *Composite materials, Processing, High temperature, Costs, Reinforced plastics.
Identifiers: *Quinoxalines, Cyclization, Polyphenylquinoxaline, Dibenzoantracene, Intramolecular, Heat resistant plastics.

Polyphenylquinoxalines containing 2,2'-bis(phenylethynyl) diphenyl moieties along the polymer backbone have been synthesized. These polymers underwent a novel curing reaction consisting of an intramolecular cyclization to a dibenzoanthracene structure, thereby increasing the rigidity and correspondingly the Tg of the polymers. The significance of this type of reaction as a major breakthrough in the processing of high-temperature polymers was shown by the properties obtained for the best system: an initial Tg of 215 C; cure at 245 C with no evolution of volatiles; a Tg after cure of 365 C. The initial Tg and cure temperature are compatible with current processing equipment. The nonvolatile intramolecular cure, as has been demonstrated in the phenylquinoxaline polymer system, should provde tough resins for reinforced composites with use temperatures far exceeding processing temperatures. (Author)

AD-A015 847/7GA PC$3.75/MF$2.25
Technion - Israel Inst of Tech Haifa Dept of Materials Engineering
Impact Strength of Angle Ply Fiber Reinforced Materials.
Interim rept. 1974-1975,
J. M. Lifshitz. Sep 75, 44p Rept nos. MED-49, Scientific-7 AFOSR-TR-75-1449
Grant AF-AFOSR-2607-74

Descriptors: *Fiber reinforced composites, Impact strength, Reinforced plastics, Fiberglass, Epoxy resins, Orientation(Direction), Stress strain relations, Failure(Mechanics), Israel.
Identifiers: *Fiberglass reinforced plastics, Epoxy matrix composites, Oriented fiber composites.

Tensile strength of angle ply balanced laminates made of glass fibers and epoxy matrix has been investigated under impact loading. An instrumented drop weight apparatus was used to apply the load and measure stress and strain during the impact process. Theoretical stress-strain curves are compared to experimental ones. Good agreement is shown to exist for fiber orientation above plus or minus 45 degrees while for lower fiber orientation the agreement is only for part of the loading process. It is shown that different failure criteria have to be used for different ranges of fiber orientation. Above plus or minus 40 degrees the experimental failure stresses agree well with theoretical predictions while below this angle the experimental values are supplemented by a qualitative discussion only. Failure stresses in the dynamic case are found to be considerably higher than the corresponding static values for the complete range of fiber orientation. The failure strains and initial effective modulus are the same for static and for impact loadings.

AD-A015 878/2GA PC$3.75/MF$2.25
Stanford Univ Calif Dept of Applied Mechanics
On the Effect of Bonding in a Laminated Composite.
Interim rept.,
Aynur Unal, and George Herrmann. May 75, 33p Rept no. SUDAM-75-2 AFOSR-TR-75-1273
Contract N00014-67-A-0112-0065, Grant AF-AFOSR-2669-74

Descriptors: *Composite materials, *Laminates, *Bonding, *Wave propagation, Matrix materials, Reinforcing materials, Layers, Plane waves, Transverse waves, Stiffness, Theory, Mathematical models.
Identifiers: Effective stiffness theory, Longitudinal waves.

The influence of the degree of bonding (ranging from perfect bond to smooth contact) between the matrix and the reinforcing layers on an unbounded, laminated, composite medium in plane strain is investigated. To this end springs are introduced between each layer. The governing equations are established within the framework of Effective Stiffness Theory. The effect of the degree of bonding on the dispersion relations of longitudinal and transverse plane harmonic waves propagating along and normal to the layering is determined. (Author)

AD-A015 885/7GA PC$5.75/MF$2.25
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
Failure Mechanisms in Composite Systems.
Final rept. 1 Jun 74-1 Jun 75,
R. F. Karlak, and F. W. Crossman. Aug 75, 133p Rept no. LMSC-D457462
Contract N00019-74-C-0339

Descriptors: *Fiber reinforced composites, Failure(Mechanics), Finite element analysis, Boron, Aluminum alloys, Orientation(Direction), Computer programs, FORTRAN, Creep, Elastic properties, Stress analysis, Yield strength, Loads(Forces).
Identifiers: SIMCRP 2 computer program, Boron reinforced composites, Aluminum matrix composites, Oriented fiber composites, FORTRAN 5 programming language.

The off-axis mechanical properties of boron-aluminum unidirectional laminae were theoretically evaluated by finite-element analysis employing generalized plane-strain with in-plane shear. Analyses were performed with a computer program capable of calculating elastic, plastic, and creep deformations as well as interface stresses induced by either mechanical loading or differential thermal displacements.

AD-A015 907/9GA PC$12.00/MF$2.25
IIT Research Inst Chicago Ill
Development of Engineering Data on the Mechanical and Physical Properties of Advanced Composites Materials.
Final technical rept. 1 Jun 71-30 Nov 73,
Kenneth E. Hofer, Jr., N. Rao, and D. Larsen.
Feb 74, 499p Rept no. IITRI-D6063-Pt-2 AFML-TR-72-205-Pt-2
Contract F33615-71-C-1713
See also Part 1 dated 1 Sep 72, AD-757 524.

Descriptors: *Fiber reinforced composites, Epoxy resins, Aluminum alloys, Titanium alloys, Matrix materials, Boron, Carbon fibers, Reinforcing materials, Silicon carbides, Reinforced plastics, Mechanical properties, Environmental tests, Fibers, Physical properties, Airframes.
Identifiers: *Boron reinforced plastics, *Carbon fiber reinforced plastics, *Boron carbide reinforced composites, *Boron reinforced composites, Graphite reinforced composites, *Epoxy matrix composites, *Aluminum matrix composites, *Titanium matrix composites, Aluminum alloy 6061, Titanium alloy 6Al 4V, Oriented fiber composites.

The program generated basic data on the effect of various environmental variables on the physical, thermal, and mechanical properties of selected resin matrix and metal matrix materials. The three resin matrix materials systems were Boron/Avco 5505, Modmor II Graphite/Narmco 5206 and Courtaulds HMS Graphite/Hercules 3002M systems. The two metal matrix materials systems were 6061 Aluminum/Boron and 6Al-4V - Titanium/BorSic Composites. The resin matrix systems were procured in the form of prepreg tapes and specimens were fabricated at IITRI materials laboratory. The metal matrix composites were fabricated by vendors in laminate form and supplied to IITRI for specimen fabrication and testing. The environments included steady state and cyclic thermal, thermo-humidity, and humidity conditioning.

N75-30264/6GA PC$11.50/MF$2.25
IIT Research Inst., Chicago, Ill.
Lamination Residual Stresses in Fiber Composites.
Interim Report, 1 Aug. 1972 - 30 Jun. 1974.
I. M. Daniel, and T. Liber. Mar 75, 468p NASA-CR-134826, IITRI-D6073-1
Contract NAS3-16766

Descriptors: *Composite materials, *Fibers, *Laminates, *Residual stress, *Stress analysis, Cyclic loads, Epoxy resins, Fiber strength, Strain gages, Stress relaxation, Tables (Data), Tensile tests.

For abstract, see STAR 1321

PAT-APPL-606 803/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Structural Material.
Patent Application,
W. C. McBee. Filed 22 Aug 75, 8p
DOCKET/MIN-2457
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Construction materials, *Patent applications, *Composite materials, *Casting, *Sulfur, *Chemical resistance, Asbestos, Fiber reinforced composites, Corrosion resistance, Thermoplastics, Reinforced plastics.

The transporting and handling of troublesome fluids such as acidic sewer wastes, industrial leach solutions, salt solutions, and acidic mine wastes is generally accomplished in concrete or transite type pipe. These materials are subject to corrosion by the reaction of the fluids with the cement binder material. This results in the disintegration of the pipe which then has to be replaced. It has now been found, according to this patent application, that a structural material of high strength and corrosion resistance may be prepared by forming a composite of plasticized molten elemental sulfur, a wetting agent, asbestos fiber and silica flour. Strength properties are further enhanced by utilization of a pressure casting technique in formation of the structural material.

11E. Fibers and Textiles

AD-A016 103/4GA PC$3.75/MF$2.25
Wisconsin Univ Madison Mathematics Research Center
Application of the Theory of Slender Curved Rods to the Analysis of Elastic Yarns.
Technical summary rept.,
N. C. Huang. Jul 75, 39p Rept no. MRC-TSR-1550
Contract DA-31-123-ARO-D-462

Descriptors: *Yarns, *Elastic properties, Elongation, Deformation, Stresses, Approximation, Rods.
Identifiers: Filament yarns.

This report summarizes recent work of the author on the application of the theory of slender curved rods to the extension of long elastic filament yarns. A formulation of a linear theory of slender curved rods is given, the rod being treated as a one-dimensional body, and this theory is then applied to investigate the small extension of two-ply and continuous filament yarns. The filaments in the yarns are treated as elastic slender curved rods with the center line of the rod lying along a circular helix. The yarn elongation and filament stresses are analyzed for yarns with various geometrics, the ends of the yarns being clamped or free. The effect of the superposition of a twisting moment on the axial extension is also discussed. In comparison with previous work on similar problems for yarns the method of the report requires fewer assumptions and approximations and can provide better geometrical and physical insights.

PAT-APPL-482 307/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Dyeing of Novoloid Fiber.
Patent Application,
Roy B. Parker. Filed 24 Jun 74, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrics, *Patents, Textiles, Dyes.
Identifiers: *Patent applications, *Dyeing, PAT-CL-264-176, *Nonvoloid fibers, *Textile processes.

This patent application relates generally to the field of bleaching and dyeing of textiles and fabrics and more particularly to a process for dyeing novoloid fibers. Novoloid fibers are generating increasing amounts of interest for use as textile material for certain types of protective clothing because of their superior flame retardant and heat resistant properties. A process for dyeing novoloid fiber without changing the thermal properties or altering the hand (textural quality or feel) is covered. After scouring and rinsing, the fabric is placed in an enclosed container with water, 1 - 5 grams per liter of a carrier such as Butyl benzoate and 0.10 - 10.0 percent of a basic dye, such as Victoria Green Crystals. This is heated to produce the desired reaction.

11F. Metallurgy and Metallography

AD-A015 716/4GA PC$3.75/MF$2.25
Ohio State Univ Columbus Dept of Metallurgical Engineering
Effects of Temperature on the Kinetics of Passive Film Growth on Iron.
Technical rept. no. 6, 1 Mar 74-28 Feb 75,
C. N. Lukac, J. B. Lumsden, Z. Smialowska, and R. W. Staehle. Sep 75, 45p Rept no. 3003-AI
Contract N00014-67-A-0232-0006

Descriptors: *Iron, *Passivity, *Corrosion inhibition, Reaction kinetics, Borates, Ellipsometers, Films, Iron oxides, Temperature.
Identifiers: Electric potential, Polarimetry.

Ellipsometry was used to investigate the effects of temperature and potential on the growth kinetics of passive films on iron exposed to a pH 8.6 borate buffer solution. It was found that over the temperature range of 0.80C the growth kinetics could be described with an equal degree of confidence by either logarithmic, inverse logarithmic, or a modified form of inverse logarithmic kinetics. None of the existing models for the film growth were found to be completely consistent with the temperature and potential dependencies of the growth constants.

AD-A015 730/5GA PC$5.75/MF$2.25
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
The Evaluation of Ti-6Al-6V-2Sn Pre-Alloyed Powder Processing.
Final rept. 15 Apr 73-31 Jan 75,
C. S. Cook, and A. R. Vaia. Jul 75, 146p AFML-TR-75-65
Contract F33615-73-C-5107

Descriptors: *Powder metallurgy, *Titanium alloys, *Powder alloys, Isostatic pressing, Hot pressing, Compacting, Heat treatment, Microstructure, Electron microscopy, Tensile strength, Homogeneity, Structural properties, Machining.
Identifiers: Titanium alloy 6Al 2Sn 6V.

The effects of input material and powder production method on the properties of Ti-6Al-6V-2Sn powder and hot isostatically pressed powder compacts have been evaluated. The variations in input material studied were material form, structure, and chemistry while the two powder production methods examined were the solid state hydride-dehydride (HD) process and the experimental molten state, Westinghouse Durarc (Registered Tradename) process. (Author)

AD-A015 831/1GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Cambridge
Growth of Multicomponent Composites from the Melt.
Final rept. Mar 71-Jul 74,
Kenneth P. Young, Edmund M. Dunn, Leo Buchakjian, Roy M. Sharp, and Merton C. Flemings. Aug 75, 90p AFML-TR-75-16
Contract F33615-71-C-1374
See also AD-A002 631.

Descriptors: *Aluminum alloys, *Copper alloys, *Nickel alloys, *Solidification, Eutectics, Phase

studies, Crystallization, Dendritic structure, Supercooling, Microstructure, Orientation(Direction), Grain structures(Metallurgy), Mechanical properties, Mathematical models.
Identifiers: Eutectic composites.

An experimental investigation of interface stability during plane front solidification of the two phase alpha plus epsilon region of the Al-Cu-Ni system has been conducted. This has shown that in this region, consistent with those previously examined, interface stability in plane front solidification can be satisfactorily predicted with the aid of a simple constitutional supercooling theory developed in earlier work. Further experimental work has been conducted on the effects of shape and direction variations on both the binary Al-Cu and ternary Al-Cu-Ni eutectic in-situ composites. These are discussed with respect to their influence on the rod on lamellae allignment and consequently the mechanical properties of the composite. Experimental results for the binary Al-Cu system and the ternary Al-Cu-Ni system give good agreement with theory.

AD-A015 966/5GA PC$3.25/MF$2.25
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
Stress Corrosion Resistance of 7050-t73 Aluminum Alloy.
Progress rept.,
I. Shaffer. 10 Sep 75, 13p Rept no. NADC-75205-30

Descriptors: *Aluminum alloys, *Stress corrosion, *Corrosion resistance, Corrosion, Exfoliation, Salt spray tests, Salt water, Liquid immersion tests, Environmental tests, Cantilever beams, Coatings, Chromates, Test methods, Tensile properties, Cracks, Yield strength.
Identifiers: Aluminum alloy 7050-T73.

The objective of this investigation was to evaluate the stress corrosion behavior of the 7050 aluminum alloy in the overaged T73 heat treat condition. Stress corrosion tests were conducted using both smooth and precracked specimens. No evidence of stress corrosion was found in any of the tests conducted. The material also exhibited immunity to exfoliation in both salt spray and constant immersion tests. (Author)

AD-A015 977/2GA PC$6.25/MF$2.25
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
Correlation of Microstructure with Fracture Toughness Properties in Metals. Part II.
Final rept. 21 Nov 73-21 Jan 75,
Richard E. Lewis, and Frank A. Crossley. 21 Jan 75, 161p Rept no. LMSC-D454884
Contract N00019-74-C-0161

Descriptors: *Titanium alloys, *Metallography, Microstructure, Fracture(Mechanics), Toughness, Crack propagation, Stress corrosion, Fatigue(Mechanics), Tensile properties, Aluminum alloys, Vanadium alloys, Tin alloys.
Identifiers: Titanium alloy 6Al 4V, Titanium alloy 6Al 2Sn 6V.

Ti-6Al-4V alloy in three mill product forms and Ti-6Al-6V-2Sn-0.7Fe-0.7Cu (Ti-662) alloy in one product form were studied for the purpose of establishing a correlation between microstructures and fracture toughness. The Ti-6Al-4V mill products were 1- and 2.4-in. plates and 4- x 4-in. forged billets. The Ti-662 product was 1-in. plate. Alloy, mill produce, processing and heat-treatment variables produced 21 microstructural conditions, complementing the 28 conditions studied in a previous contract with Naval Air Systems Command, Contract N00019-72-C-0545. Tension test, fracture toughness, salt-water stress-corrosion crack-growth threshold, and fatigue crack growth rate properties were determined. Light optical microscopy, scanning electron microfractography, and transmission electron microscopy were the metallographic means employed.

AD-A016 094/5GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Further Observations on A533-B Steel Plate Tailored for Improved Radiation Embrittlement Resistance.
Interim rept.,
J. Russell Hawthorne. 22 Sep 75, 21p Rept no. NRL-7917
Contracts AT(49-5)-2110, AT(49-25)-1003

Descriptors: *Steel, Radiation resistance, Embrittlement, Metal plates, Copper, Impurities, Reactor materials, Pressure vessels.
Identifiers: Steel A-533B.

A series of advanced investigations on the radiation performance of four 6-in.-thick plates from a large (30-ton) commercial melt of A533-B steel is described. The melt represented the first commercial-scale demonstration test of improved radiation embrittlement resistance through the control (minimization) of selected residual impurity elements. Melt specifications emphasized a low copper and phosphorus content; one half of the melt was modified however by a copper addition (copper content increased from 0.03% to 0.13%). Initial plate tests described superior 550F (288C) radiation resistance, in terms of notch ductility retention, for the primary metl composition and verified the detrimental influence of impurity copper on irradiation behavior.

AD-A016 095/2GA PC$15.25/MF$2.25
Advisory Group for Aerospace Research and Development Paris (France)
High Temperature Corrosion of Aerospace Alloys,
J. F. Stringer. Aug 75, 603p Rept no. AGARDograph-200
NATO furnished.

Descriptors: *Corrosion, *Superalloys, *Refractory metal alloys, *Heat resistant alloys, *Aerospace systems, Alloys, Refractory metals, High temperature, Oxidation, Diffusion, Reaction kinetics, Thermodynamics, Phase diagrams, Gas turbines, NATO.

As a result of increased operating temperatures being used in the design of aerospace propulsion systems and airframes, increased attention in recent years has been devoted to the subject of high temperature oxidation and corrosion of structural alloys. The AGARDograph contains summary information on oxidation rates, diffusion, reaction kinetics, engineering information on practical alloys, and tests under simulated service conditions. The document is divided into a basic section and an applied section. The basic section contains data on phase diagrams, diffusion information and thermodynamic information. The applied section deals with data on superalloys and refractory metals. The AGARDograph is intended to provide information, save time and improve the efficiency of workers in the field of high temperature corrosion of aerospace alloys.

AD-A016 121/6GA PC$3.25/MF$2.25
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Physical Sciences Directorate
Laser Damage Predictions for Aluminum and Stainless Steel Plate.
Technical rept.,
Vernon A. Neiberlein. 15 May 74, 15p Rept no. RR-74-7
Contract DA-1-T-662609-A-308

Descriptors: *Laser damage, *Radiation effects, *Aluminum, *Stainless steel, Infrared lasers, Computer applications, Predictions, Metal plates.

Laser damage predictions have been made using 'Aerotherm Prediction Procedure for Laser Effects.' This is a computer program library. Computational work was performed on a CDC-6600 computer at the US Army Missile Command. The results show the effect of using 10.6 micrometer radiation as opposed to 3.8 micrometer radiation on aluminum, and give the temperature profiles and crater shapes at burn-through on both aluminum and stainless steel. The errors involved in using a 'uniformly heated slab' approximation are given.

AD-A016 133/1GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
The Diffusion of Antimony of Alpha Iron.
Final rept.,
Gordon A. Bruggeman. Aug 75, 14p Rept no. AMMRC-TR-75-18

Descriptors: *Antimony, *Diffusion, *Iron, High temperature, Activation energy, Tracer studies, Impurities, Crystal defects, Embrittlement, Steel, Reaction kinetics.
Identifiers: Isotopic labeling, Self diffusion.

Diffusion coefficients of antimony in alpha iron were determined in the temperature range 700 to 900C using the residual activity method. Specimens were large-grained polycrystals for the higher temperature measurements and single crystals for the lower temperature measurements. The activation energy (reported in calories/mole) is approximately equal to that measured for iron self-diffusion in this same temperature range, although the antimony diffusion coefficients are a factor of ten larger than the iron self-diffusion coefficients. The potential for strongly coupled vacancy-antimony motions is demonstrated, based on the observed enhancement of iron self-diffusion in dilute iron-antimony alloys. Finally, molybdenum is shown to have a negligible effect on the diffusion of antomony in alpha iron. These results are discussed in relation to the phenomenon of temper brittleness in steels. Embrittlement kinetics in iron-antimony alloys are shown to be consistent with an antimony diffusion-controlled segregation mechanism.

ARH-1290 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Stress Corrosion Cracking of A515 Grade 60 Carbon Steel.
E. L. Moore. 27 Jul 71, 12p

Descriptors: (*Carbon steels, *Stress corrosion), (*Sodium nitrates, *Corrosive effects), Aqueous solutions, Medium temperature, Stress relaxation, Thickness, Time dependence, Welded joints.

For abstract, see NSA 32 08, number 20266.

COM-75-50566/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Dynamic Low-Temperature Elastic Properties of Two Austenitic Nickel-Chromium-Iron Alloys.
Final rept.,
W. F. Weston, H. M. Ledbetter, and E. R. Naimon. 1975, 10p
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Pub. in Materials Science and Engineering, v20 p185-194 1975.

Descriptors: *Elastic properties, *Chromium alloys, *Nickel alloys, *Iron alloys, Cryogenics, Ultrasonic tests, Modulus of elasticity, Specific heat, Poisson ratio, Shear, modulus.
Identifiers: Reprints.

The zero-magnetic-field low-temperture elastic properties of two polycrystalline nickel-chromi-

um-iron alloys were determined ultrasonically between 4 and 300 K. Results are given for: longitudinal and transverse sound velocities, Young's modulus, shear modulus, bulk modulus, Poisson's ratio, and elastic Debye temperature. Effects of alloying are discussed. The elastic property changes due to additions of chromium and iron to nickel are reviewed comprehensively.

COO-3429-26 PC$6.00/MF$2.25
Pittsburgh Univ., Pa. Dept. of Chemistry.
Thermal, Structural and Magnetic Studies of Metals and Intermetallic Compounds. Annual Report, 15 May 1974--15 May 1975.
W. E. Wallace, and V. U. S. Rao. 1 Jun 75, 59p
Contract E(11-1)-3429

Descriptors: (*Actinide alloys, *Electronic structure), (*Rare earth alloys, Electronic structure), (*Transition element alloys, Electronic structure), Binary alloy systems, Intermetallic compounds, Magnetic properties, Research programs, Ternary alloy systems, Thermodynamic properties.

For abstract, see NSA 32 08, number 20304.

COO-3446-1 PC$4.25/MF$2.25
Princeton Univ., N.J. Dept. of Aerospace and Mechanical Sciences.
Model Pseudopotentials and Atomic Properties of Simple Metals and Alloys. Final Progress Report, 1 August 1975.
D. O. Welch. 1975, 22p
Contract AT(30-1)-4198

Descriptors: (*Metals, *Crystal defects), (*Alloys, Crystal defects), Binding energy, Diffusion, Impurities, Vacancies.

For abstract, see NSA 32 08, number 20305.

COO-3476-11 PC$8.50/MF$2.25
State Univ. of New York, Stony Brook Dept. of Materials Science.
Interstitial Impurity Interactions and Dislocation Microdynamics in Mo Crystals.
D. N. Kwok. May 75, 109p
Contract AT(11-1)-3476

Descriptors: (*Molybdenum, *Mechanical properties), Degassing, Dislocations, Etching, Impurities, Interstitials, Magnetic flux, Strains, Stresses, Ultrahigh vacuum.

For abstract, see NSA 32 08, number 20306.

GESP-723 PC$6.75/MF$2.25
General Electric Co., Cincinnati, Ohio Nuclear Systems Programs.
Creep of 347 Stainless Steel in Hydrogen. Final Report.
15 Mar 72, 74p

Descriptors: (*Stainless steel-347, *Creep), Controlled atmospheres, Diagrams, Hydrogen, Reactor materials, Sheets, Space propulsion reactors, Stresses, Time dependence.

For abstract, see NSA 32 08, number 20307.

HEDL-TME-75-32 PC$4.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Tensile Properties of Irradiated Tzm and Tungsten.
J. M. Steichen. Apr 75, 34p
Contract AT(45-1)-2170

Descriptors: (*Alloy-tzm, *Physical radiation effects), (*Tungsten, Physical radiation effects), Correlations, Deformation, Ductile-brittle transitions, Ductility, Fast neutrons, Fractures, High temperature, Neutron beams, Strains, Tensile properties, Very high temperature.

For abstract, see NSA 32 08, number 20384.

JUL-1158 PC$11.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Festkoerperforschung.
Diffuse Neutron Scattering on Deformation Fields of Substitutionally and Interstitially Dissolved Defect Atoms in Metals.
G. S. Bauer. Jan 75, 156p
In German. U.S. Sales Only.

Descriptors: (*Aluminium alloys, *Crystal defects), (*Copper alloys, Crystal defects), (*Manganese alloys, Crystal defects), Coupling constants, Cross sections, Crystal lattices, Debye-waller factor, Deuterium compounds, Elastic scattering, Interstitials, Neutrons, Niobium base alloys, Niobium hydrides, Physical radiation effects.

For abstract, see NSA 32 08, number 20385.

LA-UR-75-1258 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Thermodynamic Properties of the Binary Laves Phase Compounds of Plutonium with the Group VIIIa Metals.
G. M. Campbell. 1975, 10p CONF-750915-5
Contract W-7405-eng-36

Descriptors: (*Plutonium alloys, *Thermodynamic properties), (*Iron alloys, Thermodynamic properties), (*Osmium alloys, Thermodynamic properties), (*Ruthenium alloys, Thermodynamic properties), Binary alloy systems, Correlations, Electrolytic cells, Electromotive force, Intermetallic compounds, Laves phases, Molten salts.

For abstract, see NSA 32 08, number 20310.

LA-UR-75-934 PC$4.25/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Reflected Rarefactions, Double Regular Reflection, and Mach Waves in Aluminum and Beryllium.
T. Neal. 1975, 21p CONF-750556-1
Contract W-7405-ENG-36

Descriptors: (*Aluminium, *Equations of state), (*Beryllium, Equations of state), Compression, Density, Grueneisen constant, Reflection, Shock waves, Very high pressure.

For abstract, see NSA 32 08, number 20309.

NTIS/PS-75/766/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Powder Metallurgy of Titanium and Titanium Alloys (A Bibliography with Abstracts).
Rept. for 1964-Sep 75,
Mona F. Smith. Oct 75, 78p*

Descriptors: *Bibliographies, *Titanium, *Powder metallurgy, *Titanium alloys, Compacting, Sintering, Pressing(Forming), Dispersion hardening, Fabrication, Extrusion, Heat treatment, Microstructure, Mechanical properties, Grain size, Tests, Abstracts.

The citations cover research on titanium powder preparation, compaction, sintering, hot pressing and dispersion strengthening. Properties of articles made by this method are also included. (Contains 73 abstracts) See also NTIS/PS-75/697, Powder Metallurgy of Aluminum and NTIS/PS-75/709, Powder Metallurgy of Iron.

N75-30210/9GA PC$5.25/MF$2.25
TRW Systems Group, Redondo Beach, Calif. Materials Technology Dept.
Study on Processing Immiscible Materials in Zero Gravity.
Final Report.
J. L. Reger, and R. A. Mendelson. Jun 75, 124p NASA-CR-143932, TRW-14725-6028-RU-00
Contract NAS8-28267

Descriptors: *Binary alloys, *Solubility, *Weightlessness, Electron microscopes, Mixing, Performance tests, Production engineering, Transition temperature.

For abstract, see STAR 1321

N75-30262/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A Study of the Oxide Dispersion and Recrystallization in Nicral Prepared from Preoxidized Powder.
T. K. Glasgow. 1975, 33p NASA-TM-X-71749, E-8389
Conf-Proposed for Presentation at Fall Meeting of AM. Inst. Of Mining, Met., and Petrol. Engr., Cincinnati, 10-13 Nov. 1975.

Descriptors: *Aluminum, *Chromium, *Dispersing, *Nickel alloys, *Oxides, *Recrystallization, Annealing, Extruding, Metal powder, Sintering, Swaging.

For abstract, see STAR 1321

N75-30295/0GA PC$3.25/MF$2.25
Laboratorium fuer Betriebsfestigkeit, Darmstadt (West Germany).
Fatigue Investigation of Higher Strength Structural Steels in Notched and in Welded Condition. Synthesis of Results and Tentative Conclusions.
E. Haibach, and R. Olivier. 1974, 25p TB-114(1974)
Subm-Sponsored by Ceca.

Descriptors: *Fatigue life, *High strength steels, *Notch tests, *Welded joints, Fatigue tests, Performance prediction, Reliability analysis, Stress concentration.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30296/8GA PC$3.75/MF$2.25
Royal Aircraft Establishment, Farnborough (England).
The Residual Static Strength of Fatigue Cracked Lug Specimens of Four Aluminum-Copper Alloys.
F. E. Kiddle. Sep 73, 42p RAE-TR-73084, BR37106

Descriptors: *Aluminum alloys, *Copper alloys, *Cracks, *Fatigue (Materials), *Lugs, *Static stability, Cracking (Fracturing), Creep properties, Stress analysis, Tables (Data), Tensile strength.

For abstract, see STAR 1321

N75-30297/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Chemisorption Kinetics of Hydrogen on Evaporated Iron Films.
M. R. Shanabarger. Jul 75, 13p NASA-TM-X-62458, A-6191
Contract NCA2-OR680-501
Subm-Prepared in Cooperation with Calif. Univ., Santa Barbara.

Descriptors: *Chemisorption, *Hydrogen, *Iron, *Reaction kinetics, Activation energy, Base pressure, Isothermal processes.

For abstract, see STAR 1321

N75-30298/4GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Tensile Properties of Palladium-Silver Alloys with Absorbed Hydrogen.
R. J. Smith, and D. A. Otterson. Aug 75, 18p NASA-TM-X-3277, E-8161

Descriptors: *Hydrogen, *Palladium alloys, *Silver alloys, *Tensile properties, Crystal lattices, Crystallography, Phase transformations, Transition.

For abstract, see STAR 1321

N75-30299/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Crack-Closure and Crack-Growth Measurements in Surface-Flawed Titanium Alloy Ti-6Al-4V.
W. Elber. Sep 75, 17p NASA-TN-D-8010, L-10099

Descriptors: *Aluminum alloys, *Crack initiation, *Surface defects, *Titanium alloys, Crack propagation, Cyclic loads, Fracture mechanics, Stress concentration, Vanadium alloys.

For abstract, see STAR 1321

N75-30300/8GA PC$7.00/MF$2.25
Acurex Corp., Mountain View, Calif. Aerotherm Div.
Analytic and Experimental Evaluation of Flowing Air Test Conditions for Selected Metallics in a Shuttle Tps Application.
Final Report.
J. W. Schaefer, H. Tong, K. J. Clark, K. E. Suchsland, and G. J. Neuner. Aug 75, 193p NASA-CR-2531
Contract NAS1-10913

Descriptors: *Chromium alloys, *Heat shielding, *Nickel alloys, *Space shuttle orbiters, *Thermal protection, Air flow, Flight tests, Niobium alloys, Performance prediction, Plasma jets, Thermochemical properties.

For abstract, see STAR 1321

N75-30592/0GA PC$3.25
Institut Superieur d'Electronique du Nord, Lille (France). Lab. d'Ultrasons.
Production of Rayleigh Waves in Non-Piezo-Electric Materials and Application to the Study and Detection of Faults Due to Materials Fatigue Production des Ondes de Rayleigh sur des Materiaux Non Piezoelectriques et Application a l'Etude at a la Detection des Defauts Dus a la Fatigue des Materiaux.
Final Report.
J. Pouliquen, G. Leman, and A. Defebvre. 1974, 24p
Contract DGRST-73-7-1115
In French: English Summary.

Descriptors: *Crack initiation, *Fatigue (Materials), *Rayleigh waves, *Steels, Cyclic loads, Stress concentration, Stress corrosion, Surface roughness.

For abstract, see STAR 1321

ORNL-TM-4992 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Correlation and Extrapolation of Creep Ductility Data for Four Elevated Temperature Structural Materials.
M. K. Booker, C. R. Brinkman, and V. K. Sikka. Aug 75, 34p
Contract W-7405-eng-26

Descriptors: (*Stainless steel-304, *Creep), (*Stainless steel-316, Creep), (*Chromium-molybdenum steels, Creep), (*Inconel 718, Creep), Ductility, High temperature, Temperature dependence.

For abstract, see NSA 32 08, number 20316.

PAT-APPL-506 921/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Electrolysis Apparatus and a Method of Hydrodynamic Cavitation Protection.
Patent Application,
Earl Quandt, and Kenneth Kasza. Filed 17 Sep 74, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cavitation corrosion, *Electrolytic cells, *Corrosion inhibition, Patents, Hydrofoils, Hydrodynamics, Turbines.
Identifiers: *Patent applications.

The patent application discloses a method and apparatus for protecting the surfaces of hydrodynamic members subjected to a cavitating fluid environment such as seawater. A conductive metal insert is affixed to and electrically insulated from the surface of the member where cavitation damage is most likely ot occur. A variable d-c voltage is connected between the metal insert (cathode) and the hydrodynamic member (anode). As the voltage is applied, a protective layer of hydrogen gas bubbles is formed over the conductive metal insert to thereby cushion the shock of the collapse of the cavitation voids.

PAT-APPL-579 640/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Recovery of Zinc from Zinc Chloride by Fused Salt Electrolysis.
Patent Application,
Donald E. Shanks, and Frank P. Haver. Filed 21 May 75, 6p DOCKET/MIN-2318
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Zinc, *Electrowinning, *Patent applications, Fused salts, Zinc chlorides, Lithium chloride, Potassium chloride, Electrolysis, Air pollution, Abatement.
Identifiers: Air pollution abatement.

In the patent application metallic zinc is recovered from zinc chloride by electrolysis of a molten mixture of zinc chloride and an electrolyte consisting essentially of lithium chloride and potassium chloride. The electrolyte preferably consists of the LiCl-KCl eutectic mixture containing 59 mole percent LiCl and 41 mole percent KCl. The impurity specifications and pollution control regulations are met to a great extent by the electrolytic process.

PB-245 073/2GA PC$4.25/MF$2.25
Montana Coll. of Mineral Science and Technology, Butte. Dept. of Mineral Dressing.
Leach of Copper Reverberatory Slag.
Master's thesis,
Ralph E. Dufresne. 15 Apr 74, 66p Mont/Tech-4/74 NSF/RA/T-74-101
Grant NSF-GI-39450

Descriptors: *Extractive metallurgy, *Leaching, *Slags, Copper, Zinc, Chemical reactions, Sulfuric acid, Theses.

The behavior of copper reverberatory slag system was constructed using leaching environment. Theoretical model of slag system was constructed using physical, thermodynamic, and kinetic information. Based on this information, leaching systems were designed and were evaluated by experiment. High copper and zinc extractions were achieved only in those systems where the iron silicate matrix of slag was substantially decomposed.

PB-245 074/0GA PC$3.25/MF$2.25
Montana Coll. of Mineral Science and Technology, Butte. Dept. of Metallurgy.
Leach of Copper Reverberatory Slag by Sulfuric Acid: A Kinetic Study.
Summary rept.,
R. E. Dufresne, and L. G. Twidwell. Dec 74, 21p Mont/Tech-12/74 NSF/RA/T-74-097
Grant NSF-GI-39450

Descriptors: *Copper, *Slags, *Leaching, Extractive metallurgy, Sulfuric acid, Reaction kinetics, Hydrodynamics, Rotation, Chemical reactions, Iron, Materials recovery, Surfaces, Smelting.

The kinetic parameters for leaching copper reverberatory slags in sulfuric acid have been determined by a rotating disk technique. This technique allows precise control of hydrodynamic conditions and provides a reaction surface that is of constant area. This study of slag leaching combines the advantages of the rotating disk and batch leaching methods while avoiding the difficulties of sintering and use of synthetic materials.

PB-245 075/7GA PC$4.75/MF$2.25
Missouri Univ., Rolla.
A New and Direct Process for the Reduction of Lead Sulfide.
Master's thesis,
Rolando Oscar Fernandez. 1973, 83p NSF/RA/T-73/067

Descriptors: *Air pollution abatement, *Lead ores, *Reduction(Chemistry), *Smelting, Iron, Sulfur dioxide, Extractive metallurgy, Lead sulfides, Theses.
Identifiers: Lead smelting.

The main environmental problem associated with lead smelting is the emission of sulfur dioxide which above a certain concentration is hazardous to human health and plant life. The direct reduction of lead sufide concentrates by iron was investigated. An oxygen bearing flux was shown to be a necessary ingredient for complete reduction of the concentrate. The effects of time and temperature on lead recovery were studied. Only a trace amount of sulfur dioxide is evolved during reduction, which is in agreement with thermochemical calculation.

PB-245 084/9GA PC$4.25/MF$2.25
Montana Coll. of Mineral Science and Technology, Butte. Dept. of Metallurgy.
Neutralization of Excess Sulfuric Acid with Reverberatory Slag.
Progress rept. 15 Jun 73-15 Jun 75,
L. G. Twidwell. 1974, 56p Mont/Tech-6/74 NSF/RA/T-74-046a
Grant NSF-GI-39450

Descriptors: *Air pollution control, *Copper, *Lead, *Zinc, *Smelting, *Solid waste disposal, Extractive metallurgy, Slags, Sulfuric acid, Chemical reactions, Leaching, Roasting, Sulfur dioxide, Flue gases, Materials recovery, Calcium sulfates, Neutralizing.
Identifiers: Liquid waste disposal, Waste recycling, Copper smelting, Lead smelting, Zinc smelting.

In their efforts to meet the limitations on furnace sulfur emissions, copper, lead, and zinc smelters are producing sulfuric acid. When they have produced more than they can sell, they must dispose of excess in an environmentally acceptable manner. The proposed process offers a method whereby another large volume throwaway product, slag, can be used to neutralize the excess acid. The research in progress has demonstrated that metal values can be effectively extracted from copper reverberatory slags by sulfuric acid treatment. Optimum conditions for metal value recoveries have been established for a leach, residue roast

procedure, i.e., greater than 90% Cu extraction, 85-95% Zn extraction. Other treatment techniques are currently being investigated and experimental progress is reported.

PB-245 098/9GA PC$4.25/MF$2.25
Montana Coll. of Mineral Science and Technology, Butte. Dept. of Metallurgy.
Neutralization of Excess Sulfuric Acid with Reverberatory Slag.
Progress rept. Jun 73-Jun 74,
L. G. Twidwell. 1974, 56p Mont/Tech-1/75
NSF/RA/T-74-046
Grant NSF-GI-39450

Descriptors: *Air pollution control, *Copper, *Lead, *Zinc, *Smelting, *Sulfuric acid, Slags, Leaching, Roasting, Iron sulfate, Extractive metallurgy, Flue gases, Residues, Electron probes, Solid waste disposal, Neutralizing, Calcium sulfates, Material recovery.
Identifiers: Waste recycling, Liquid waste disposal, Copper smelting, Lead smelting, Zinc smelting.

In their efforts to meet the limitations on furnace sulfur emissions, copper, lead and zinc smelters are producing sulfuric acid. Future projections predict an excess of this acid which must be disposed of in an environmentally acceptable manner. The proposed process offers a method whereby another large volume by-product, slag, can be used to neutralize the excess acid. The laboratory research study has demonstrated that metal values can be effectively extracted from copper reverberatory slags by sulfuric acid treatment. Optimum conditions for metal value recoveries have been established for a leach, residue roast procedure. Extraction of greater than 90%Cu, 85-90%Zn has been demonstrated using this technique. A disadvantage is that iron sulfate solution is produced and must be treated in an environmentally acceptable manner. A second treatment technique has been studied that produces no liquid waste and very little gaseous sulfur oxide emissions (greater than 90% sulfur retention). This technique is a leach-lime-roast.

PB-245 194/6GA PC$10.00/MF$2.25
Battelle Columbus Labs., Ohio.
Study of the Energy and Fuel-Use Patterns in the Nonferrous Metals Industries.
Final rept.,
E. H. Hall, E. S. Bartlett, F. H. Buttner, H. N. Conkle, and D. C. Drennen. 31 Dec 74, 356p*
FEA/EI-1658
Contract DI-14-01-0001-1658

Descriptors: *Metal industry, *Fuel consumption, *Aluminum industry, *Zinc industry, *Energy consumption, Propane, Butanes, Residual oils, Gasoline, Petroleum products, Coal, Lubricants, Natural gas, Petroleum coke, Electricity, Distillates, Smelting, Briquetting, Sintering, Refining, Substitutes, Energy conservation, Geographic locations, Processing, Industries, Energy supplies, Energy sources, Mineral deposits.
Identifiers: *Nonferrous metals, *Copper industry, *Lead industry, SIC 3331, SIC 3332, SIC 3333, SIC 3334, SIC 3339, SIC 3341, SIC 3351, SIC 3352, SIC 3356, SIC 3357, *Heat consumption, *Electric power consumption, Fuel substitution.

This report covers the patterns of energy use in 10 SIC's within the nonferrous metals industries. Total energy use, broken down by fuel type, is estimated for each of the 10 industries and for major processes within each industry. A review of each industry is presented with respect to: the potential for fuel switching, opportunities for short-term conservation, sources of fuels and energy supply, levels of fuel stocks, key constraints on industry operations, and industry products which may be critical to the needs of Project Independence. The 10 industries included in the study are: primary copper; primary lead; primary zinc; primary aluminum; primary nonferrous metals; secondary nonferrous metals; copper rolling and drawing; aluminum rolling and drawing; nonferrous rolling and drawing; nonferrous wire, drawing and insulation. Also included are industry projection details. Portions of this document are not fully legible.

RD/B/N-3355 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Corrosion of Steels in Molten Sodium Hydroxide. Part 1. The Experimental Approach and Preliminary Presentation of Results for the Corrosion of 2 1/4--1 Mo by Static Sodium Hydroxide.
R. N. Newman, C. A. Smith, and R. J. Smith. Mar 75, 15p
U.S. Sales Only.

Descriptors: (*Chromium-molybdenum steels, *Corrosion), (*Sodium hydroxides, *Corrosive effects), Hydrogen, Pressure measurement, Sodium, Water.

For abstract, see NSA 32 08, number 20267.

SAND-74-5545 PC$5.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Susceptibility of Microweids in Hybrid Microcircuits to Corrosion Degradation.
J. L. Jellison. 1974, 38p CONF-750450-1

Descriptors: (*Aluminium alloys, *Corrosion), (*Silver alloys, Corrosion), (*Gold alloys, Corrosion), Auger electron spectroscopy, Electron microscopy, Failures, Welded joints.

For abstract, see NSA 32 08, number 20321.

SAND-75-0191 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Stress Corrosion Cracking in Quenched and Underaged U-6 Wt.% NB.
N. J. Magnani. Jul 75, 20p
Contract AT(29-1)-789

Descriptors: (*Niobium alloys, *Stress corrosion), (*Uranium base alloys, Stress corrosion), (*Chlorine, *Corrosive effects), (*Oxygen, Corrosive effects), Aging, Binary alloy systems, Cracks, Gases, High temperature, Quenching, Time dependence.

For abstract, see NSA 32 08, number 20269.

SAND-75-5241 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Simultaneous Integral Measurement of Electron Energy and Charge Albedoes.
G. J. Lockwood, G. H. Miller, and J. A. Halbleib, Sr.. 8p CONF-750703-7

Descriptors: (*Beryllium, *Electron collisions), (*Molybdenum, Electron collisions), (*Tin, Electron collisions), (*Tantalum, Electron collisions), Albedo, Backscattering, Calorimeters, Deposition, Electron beams, Energy spectra, Mev range 01-10, Modulation, Targets.

For abstract, see NSA 32 08, number 20788.

SAND-75-5309 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Electron Microprobe Study of the Homogeneity of Silicon--Germanium Alloys.
W. F. Chambers. 1975, 13p CONF-750652-1

Descriptors: (*Radioisotope batteries, *Thermoelectric materials), (*Silicon alloys, *Quality control), (*Germanium alloys, Quality control), Electron microprobe analysis, Hot pressing, Thermoelectric generators.

For abstract, see NSA 32 08, number 20411.

UCRL-76537 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Enthalpy and Heat Capacity of Liquid Plutonium and Uranium.
W. L. Thayer, and J. L. Robbins. 9 Jul 75, 9p
CONF-750915-1

Descriptors: (*Plutonium base alloys, *Enthalpy), (*Gallium alloys, Enthalpy), (*Enriched uranium, Enthalpy), (*Plutonium-delta, Enthalpy), Dilute alloys, Fission, Liquid metals, Neutron reactions, Radiation heating, Specific heat, Super kukla reactor, Very high temperature.

For abstract, see NSA 32 08, number 20323.

Y-1984 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Study of the Retention of Metastable Phases in Quenched Uranium--Niobium--Zirconium Ternary Alloys.
R. H. Cooper, Jr.. Aug 75, 43p
Contract W-7405-eng-26

Descriptors: (*Uranium base alloys, *Phase studies), (*Niobium alloys, Phase studies), (*Zirconium alloys, Phase studies), Bcc lattices, Chemical composition, Lattice parameters, Microhardness, Phase diagrams, Quenching, Ternary alloy systems, Uranium-gamma, Vegard law.

For abstract, see NSA 32 08, number 20324.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A016 125/7GA PC$5.25/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
Extended Oil and Oil Filter Change Interval for DOD 5- to 200-Kilowatt DED Generator Sets --- Interim Report on 60- and 100-Kilowatt Sets.
Interim rept. 1972-1975,
John W. Dreger, Sidney Levine, and Basil Zanedis. Aug 75, 111p Rept no. USAMERDC-2153

Descriptors: *Diesel engines, *Lubricating oils, *Oil filters, Performance tests, Time intervals, Life cycle testing, Maintenance, Chemical analysis, Cost estimates.
Identifiers: Spectrochemical analysis.

All in-house investigation is described to determine whether the industry- and military-standard oil change interval of 100 hours could be extended for DOD Family of Diesel Engine Driven Generator Sets using MIL-L-2104C specification lubricating oil. The investigation was conducted in two phases. In Phase I, the oil and filter were changed each 100 hours in accordance with the servicing and maintenance guide for the preproduction model 5,000-hour reliability and acceptance test. In Phase II, the oil and filter change interval was established by the condition of the oil. The condition of the oil was monitored by chemical and spectrometric analyses. Based on test results and the urgency of the current energy crisis, the Project Manager, Modile Electric Power, issued an interim oil change policy directing that the oil and oil filters be changed each 300 hours of engine running (normal running conditions) or after 6 months, whichever comes first. It is conservatively estimated that a savings in excess of $1.5 million a year can be realized by the military with the implementation of this directive.

N75-30565/6GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Isothermal Elastohydrodynamic Lubrication of Point Contacts. 1: Theoretical Formulation.
B. J. Hamrock, and D. Dowson. Aug 75, 31p
NASA-TN-D-8049, E-8295

Descriptors: *Bearings, *Elastohydrodynamics, *Lubrication, Gears, Numerical analysis, Reynolds equation.

For abstract, see STAR 1321

N75-30569/8GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Electron Microscope Surface Examination of the Mechanisms of Wear of Specimens from Tests with Oils Containing Sulfur.
J. Wagner, E. Eberhardt, and R. Buechner. Aug 75, 14p NASA-TT-F-19526
Contract NASW-2790
Tran-Transl. Into English from Schmierungstechnik (West Germany), 5/2, Feb. 1974 p 46-51.

Descriptors: *Electron microscopes, *Sulfur, *Surface layers, *Wear tests, Erosion, Friction factor, Lubricating oils, Test stands.
Identifiers: Translations.

For abstract, see STAR 1321

11I. Plastics

AD-A015 661/2GA PC$4.25/MF$2.25
California Univ Berkeley Dept of Chemical Engineering
Viscoelastic Properties of Entangled Polymers. I. The Elastically Coupled Entanglement Model.
Technical rept.,
David R. Hansen, Michael C. Williams, and Mitchel Shen. 1 Oct 75, 53p Rept no. TR-4
Contract N00014-75-C-0955

Descriptors: *Polymers, *Viscoelasticity, Coupling(Interaction), Mathematical models, Polystyrene, Molecular weight, Mathematical prediction, Equations of motion, Matrix materials, Eigenvectors, Numerical analysis, Chemical equilibrium, Relaxation time, Computer programs.
Identifiers: *Entanglement.

The bead-and-spring model of Rouse, Bueche and Zimm is extended to describe the viscoelastic behavior of polymers with chain entanglements. Motion of the macromolecules is retarded by the presence of entanglements with neighboring chains. This effect is in part represented by selected beads along the chain having enhanced friction coefficients. These selected beads may have values of friction coefficients that are uniformly higher than the unentangled beads, or are progressively higher as a function of the position along the chain. Major improvements in the model result when these entangled points are also assumed to be elastically coupled to the surrounding medium. This coupling is modelled by interconnecting the entangled beads with springs having low spring constants. The resulting equations of motion of the model contain a modified Zimm matrix that is nonsymmetrical. The eigenvalues were obtained numerically on the computer to yield the relaxation spectra, permitting calculation of dynamic moduli, relaxation moduli, equilibrium shear compliance and zero-shear viscosity for a series of molecular weights. Agreement with experimental data on monodisperse polystyrene was found to be excellent for all these properties. Of particular interest is the ability of the model to predict the equilibrium shear compliance as a function of molecular weight, which was not achievable by earlier theories. The sensitivity of J suber to the fitting parameters renders it a useful discriminator in selecting the best model for describing chain entanglement effects in polymer viscoelasticity.

AD-A015 698/4GA PC$3.25/MF$2.25
Massachusetts Univ Amherst Materials Research Lab
The Effect of Molecular Weight on the Physical and Mechanical Properties of Ultra-Drawn High Density Polyethylene.
Interim rept.,
William G. Perkins, Numa J. Capiati, and Roger S. Porter. 1 Aug 75, 20p Rept no. TR-3
Contract N00014-75-C-0686

Descriptors: *Polyethylene plastics, Physical properties, Mechanical properties, Modulus of elasticity, Tensile strength.
Identifiers: High density polymers.

A study has been made on the effects of molecular weight on the physical and mechanical properties of cold-extruded high density polyethylene, HDPE. Prior data indicate that such ultra-drawn strands contain a significant fraction of extended-chain crystals. Four HDPE samples, spanning the molecular weight range of 59,000 to 147,000 were cold extruded under the same conditions and were examined with respect to their melting point, degree of crystallinity, linear expansion coefficient, Young's modulus and tensile strength. The degree of crystallinity, linear expansion coefficient and modulus did not change significantly with molecular weight. The melting point and tensile strength do increase with increasing molecular weight. This leads to the conclusion that the amount of extended-chain crystals may increase with molecular weight. Higher molecular weight polymers are thus seen as providing a greater number of tie chains to give the fiber a higher tensile strength.

AD-A015 704/0GA PC$3.25/MF$2.25
Massachusetts Univ Amherst Materials Research Lab
The Concept of One Polymer Composites Modeled with High Density Polyethylene.
Technical rept.,
Numa J. Capiati, and Roger S. Porter. 1 Aug 75, 24p Rept no. TR-4
Contract N00014-75-C-0686
Prepared in cooperation with Universidad Nacional del Sur, Bahia Blanca (Argentina). Planta Piloto de Ingenieria Quimica.

Descriptors: *Reinforced plastics, *Polyethylene plastics, *Composite materials, Morphology, Films, Melting point, Synthetic fibers, Thermoplastic resins, Tensile strength.
Identifiers: One polymer composites, High modulus polymers, Polyethylene fibers, Polymer matrix composites, Fiber reinforced composites.

The effort described here is to present a novel idea in reinforced polymeric materials, the one polymer composite. This corresponds to a composite in which the matrix and reinforcement are made from different morphologies of the same polymer. As a model case, polyethylene has been used through this study; the results, nonetheless, may be generally extended to other semicrystalline thermoplastics. High modulus polyethylene fiber and film strips have been prepared by a solid-state (crystal-crystal) transformation. The resulting morphology has been subjected to intense characterization. Important characteristics of these fibers and film strips are their optical transparency and their high and time and temperature insensitive Young's moduli. Typical melting endotherms for the oriented fiber and the starting polyethylene, are shown. The melting point difference between the fiber and matrix is the defining feature for the one polymer composite. The melting point difference makes possible the dispersion of the polyethylene fibers in the melt of the polyethylene matrix.

AD-A016 127/3GA PC$4.25/MF$2.25
McDonnel Douglas Astronautics Co., St. Louis, Mo.
Development of a Water Soluble Foam Packaging Material.
Final rept. Oct 74-Jan 75,
T. J. McCown, and G. E. Wahlmann. Jan 75, 73p
NDC-TR-75-88-FEL, FEL-26
Contract DAAK03-74-C-0185

Descriptors: *Expanded plastics, *Cellulosic resins, *Packing materials, Solubility, Water, Humidity, Exposure(General), Dissolving, Salt water, Thermoplastic resins.
Identifiers: Cellulose/(hydroxypropyl-ether).

The purpose of this program was to investigate the feasibility of developing and reliably reproducing a water soluble foam from hydroxypropyl cellulose resin (Klucel) and to establish product parameters. The program was divided into two phases. In Phase I, the feasibility of extruding the water soluble, thermoplastic resin into a candidate packaging material was successfully demonstrated. Hydroxypropyl cellulose was extruded by conventional means into a loose-fill packaging foam having a compressive stiffness conforming to Federal Specification PPP-C-850, Cushioning Material, Polystyrene Expanded, Resilient, Class 4 (Extra Firm). In Phase II, the loose-fill foam product from this resin was tested. Additional investigations conducted on the loose-fill samples were: Effects of long and short term relative humidity exposure; and solubility and dissolution rates in fresh and salt waters. Long term humidity exposure caused the material to deteriorate and lose all foam cushioning properties.

AD-A016 249/5GA PC$4.25/MF$2.25
Case Western Reserve Univ Cleveland Ohio Dept of Macromolecular Science
The Environmental Stress-Crazing and Cracking in Polystyrene Under High Pressure,
K. Matsushige, S. V. Radcliffe, and E. Baer. 30 Sep 75, 56p Rept no. TR-276
Contract N00014-75-C-0795

Descriptors: *Polystyrene, *Fracture(Mechanics), Stresses, Crack propagation, Tensile stress, Creep, Diffusion, Silicones, Viscosity, Water, Hydrostatic pressure, Mechanical properties, Amorphous materials.

Tensile experiments on polystyrene (PS) in various pressure-transmitting fluids were performed up to 4.0 kb to study the effects of test media on the mechanical behavior of amorphous polymers under pressure. The fracture stress of PS in silicon oil environment was found to depend strongly on the viscosity of oil and the strain-rate of tensile tests. In addition, creep fracture experiments conducted at 2.5 kb in silicon oil with different viscosities suggested that the environmental effects are governed by the rate of diffusion of the environmental liquid into the tensile specimen. It was also found, that water, which hardly affects the mechanical behavior of PS at atmospheric pressure, becomes a significant stress-cracking agent under higher pressure.

PB-244 874/4GA PC$3.75/MF$2.25
Utah Univ., Salt Lake City. Flammability Research Center.
The Effects of Fire Retardants on the Combustion of Rigid-Urethane Foams,
M. M. Birky, I. N. Einhorn, J. D. Seader, M. D. Kanakia, and W. P. Chien. 24 Oct 73, 35p
FRC/UU-14, UTEC-73-178 NSF/RA/E-73-197

Descriptors: *Combustion, *Polyurethane resins, *Flammability tests, *Smoke abatement, Flameproofing, Combustion products, Ignition, Flame propagation, Additives.
Identifiers: Rigid foams.

A study was undertaken in the Flammability Research Center of the University of Utah to determine the parameters which govern the smoke emission characteristics of rigid-urethane foams. Special emphasis was directed toward an understanding of the chemical and physical parameters governing the smoking tendency and light obscuration during the combustion process, and the effect of fire retardants in terms of type and concentration. Three fire retardants, typical of reactive and non-reactive systems used in commerce, were selected for incorporation into a rigid urethane. There is some improvement in resistance to ignition, flame penetration, and flame propagation, with the brominated retardant being generally superior in concentrations of at least 12%.

11K. Solvents, Cleaners, and Abrasives

N75-30313/1GA PC$3.75/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Test Methods and Results for Eight Samples of Alkali-Free Steam Cleaning Agents and Nine Samples of Alkaline Lacquer and Grease Removing Agents.
M. J. Reidt. Aug 75, 29p NASA-TT-F-16504, M-67-708
Contract NASW-2791
Tran-Transl. Into English of "De Keuring van 8 Monsters van Alkalivrij Stoomreinigings-Middelen en 9 Monsters van Alkalische Ontlaken Ontvettingsmiddelen en de Aanpassing van de Keuringsmethodiek", Rept. M-67-708 Metaalinstituut TNO, Delft, Netherlands, 16 Oct. 1967, 26 p.

Descriptors: *Alkalies, *Chemical cleaning, *Cleaners, Chemical composition, Corrosion prevention, Specifications.
Identifiers: Translations.

For abstract, see STAR 1321

11L. Wood and Paper Products

AD-A015 654/7GA PC$3.25/MF$2.25
Forest Products Lab Madison Wis
Dielectric Properties of Wood and Hardboard: Variation with Temperature, Frequency, Moisture Content, and Grain Orientation.
Forest Service research paper,
William L. James. 1975, 34p Rept no. FSRP-FPL-245

Descriptors: *Wood, *Dielectric properties, Moisture, Temperature, Electric fields, Orientation(Direction), Tables(Data).
Identifiers: *Hardboards, Fir wood, Oak wood.

The dielectric constant and loss tangent of white oak, Douglas-fir, and four commercial hardboards were measured at frequencies from 20 Hertz(Hz) to 50 Megahertz(MHz), moisture conditions from ovendry to complete saturation, temperatures from -20 to +90C., and, for the natural wood, with the electric field alined with three principal structural orientations. The hardboard was measured with the electric field perpendicular to the faces of the board. The behavior of all materials studied was qualitatively similar. The dielectric constant increased with increasing moisture content or temperature, and decreased with increasing frequency.

AD-A015 679/4GA PC$3.25/MF$2.25
Forest Products Lab Madison Wis
Mechanical Properties of 23 Species of Eastern Hardwoods.
Forest Service research note,
B. Alan Bendtsen, and Robert L. Ethington. Aug 75, 12p Rept no. FSRN-FPL-0230

Descriptors: *Wood, Mechanical properties, Tables(Data), Construction materials, United States.
Identifiers: Eastern Region(United States).

Important mechanical properties of clear, straight-grained wood of 23 species are tabulated, along with coefficients of variation. These property estimates can be used to match up species with kind of material needed for a specific job, or to search for substitutes for a presently used species. Some of the species appear, with allowable properties, in two published plywood manuals. There are no similar hardwood lumber stress grades, but standard methods exist for generating them, should interest develop.

AD-A015 680/2GA PC$3.25/MF$2.25
Forest Products Lab Madison Wis
Storage of Red Alder Chips With and Without Bark - Treated and Untreated.
Forest Service research paper,
E. L. Springer, F. L. Schmidt, W. C. Feist, L. L. Zoch, Jr., and G. J. Hajny. 1975, 11p Rept no. FSRP-FPL-261

Descriptors: *Wood, *Wood pulp, Storage, Preservatives.
Identifiers: Bark, *Alder wood, Wood chips, Wood preservatives, Carbamic acid/dithio-N-methyl-(sodium salt), Phenol/dinitro-(sodium salt).

Screened chips from unbarked (rough wood) and debarked red alder logs were stored for 6 months in simulators of chip piles. Only minor differences were found in storage characteristics of the chips. During the last 4 months of storage, slightly more heat was evolved from the barkfree chips. Large losses in wood substance, pulp yield, and pulp strength were observed; however, they were essentially the same for both rough wood and debarked chips. Both types of chips also were treated by immersing in an aqueous solution of sodium N-methyldithiocarbamate + sodium 2,4-dinitrophenol and both types were effectively preserved.

AD-A015 681/0GA PC$3.25/MF$2.25
Forest Products Lab Madison Wis
Effect of Rate of Loading and Duration of Load on Properties of Particleboard.
Forest Service research paper,
J. Dobbin McNatt. 1975, 17p Rept no. FSRP-FPL-270

Descriptors: *Wood, Wallboard, Bending stress, Tensile properties, Shear properties, Loads(Forces), Regression analysis, Construction materials, Stress analysis.
Identifiers: *Particle boards.

Two conditions of loading which must be investigated to arrive at allowable working stresses for particleboard are (1) changes in rate of applying the load and (2) the duration of load to failure for materials under a constant load. This report presents the results of a study of the effects of rate of loading in bending tension, and shear and of duration of load in tension on the properties of several commercial particleboards and one laboratory-made board. Regression analysis of data for particleboards under constant stress levels in tension indicated that duration of load to failure increased tenfold for each 8.3 percent decrease in stress, when stress is expressed as a percent of static strength. This agrees with other published particleboard data when the same method of analysis is used.

AD-A015 682/8GA PC$3.25/MF$2.25
Forest Products Lab Madison Wis
Humidity Effects on Properties of Structural Particleboards from Forest Residues.
Forest Service research paper,
J. Dobbin McNatt. 1975, 15p Rept no. FSRP-FPL-267

Descriptors: *Wood, *Humidity, *Test methods, Exposure(General), Shear stresses, Residues, Loads(Forces), Bending, Compressive properties, Tension.
Identifiers: *Particle boards, Wood wastes, Fir wood.

The effects of exposure to various humidities on particleboard properties are important factors to be considered when using basic engineering data in developing design stresses for efficient structural application. It is necessary to determine these effects to avoid possible problems related to loss in load-carrying capacity and stiffness where high humidity exposure is likely. In this study, bending, tension, compression, and shear properties at five different humidity exposures are reported for three structural particleboard types made from Douglas-fir forest residues.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A015 655/4GA PC$3.75/MF$2.25
Institute for Defense Analyses Arlington Va Program Analysis Div
A Generalized Stochastic Lanchester Attrition Process,
Alan F. Karr. Sep 75, 28p Rept no. P-1080
IDA/HQ-74-16780

Descriptors: *Attrition, *Lanchester equations, Heterogeneity, Force level, Stochastic processes, Computerized simulation, Kill probabilities, Weapons, Classification, War games, Attack, Ratios, Linear systems, Markov processes.
Identifiers: Idagam 1 war game, Lanchester square law, Lanchester linear law.

A mixed-mode, heterogeneous, stochastic Lanchester attrition process is described, which is based on a four-category classification of weapons. Comments are made concerning the distinction between square-law and linear-law combat. Potential applicability of the model in combat simulations is also discussed. (Author)

AD-A015 656/2GA PC$3.75/MF$2.25
Institute for Defense Analyses Arlington Va Program Analysis Div
On Simulations of the Stochastic, Homogeneous, Lanchester Linear-Law Attrition Process,
Alan F. Karr. Sep 75, 36p Rept no. P-1113
IDA/HQ-75-17243

Descriptors: *Attrition, *Lanchester equations, War games, Computerized simulation, Stochastic processes, Homogeneity, Linear systems, Monte Carlo method, Personnel detection, Survival(Personnel), Time dependence, Tables(Data), Force level, Casualties, Mathematical prediction, Iterations, Markov processes.
Identifiers: Lanchester linear law, Idagam 1 war game.

Results of computerized Monte Carlo simulations of a stochastic, homogeneous Lanchester-linear attrition process are presented. Properties investigated include expected numbers of survivors as functions of time, iterated calculations of expected numbers of survivors, probabilities of forcing the opposing side below a certain fraction of initial strength before being so reduced, and relations of the stochastic model to the deterministic Lanchester-linear model. (Author)

AD-A015 657/0GA PC$3.25/MF$2.25
Institute for Defense Analyses Arlington Va Program Analysis Div
Combat Processes and Mathematical Models of Attrition,
Alan F. Karr. Sep 75, 20p Rept no. P-1081
IDA/HQ-74-16781

Descriptors: *Attrition, Heuristic methods, War games, Computerized simulation, Force level, Classification, Conventional warfare, Barriers, Attack, Penetration, Lanchester equations, Binomials, Casualties.
Identifiers: Theater level operations, Idagam 1 war game, Lanchester square law, Lanchester linear law.

A general, heuristic scheme for classification of combat processes is presented. The context of the classification is that of computer simulation of theater-level, nonnuclear combat. General comments on attrition modeling are made and preferred attrition models are suggested for certain combat situations. (Author)

AD-A015 658/8GA PC$3.75/MF$2.25
Institute for Defense Analyses Arlington Va Program Analysis Div
On Simulations of the Stochastic, Homogeneous Lanchester Square-Law Attrition Process,
Alan F. Karr. Sep 75, 35p Rept no. P-1112
IDA/HQ-75-17242

Descriptors: *Attrition, *Lanchester equations, War games, Computerized simulation, Homogeneity, Stochastic processes, Monte Carlo method, Survival(Personnel), Time dependence, Mathematical prediction, Force level, Ratios, Casualties, Tables(Data), Markov processes, Iterations.
Identifiers: Lanchester square law, Idagam 1 war game.

Results of computerized Monte Carlo simulations of a stochastic, homogeneous Lanchester square-law attrition process are described. Topics investigated include expected numbers of survivors at fixed times, iterated calculations of expected numbers of survivors, and probabilities of forcing the opposing side below a prescribed fraction of initial strength before being so reduced, especially in relation to the Lanchester-square force ratio. (Author)

AD-A015 670/3GA PC$3.25/MF$2.25
George Washington Univ Washington D C Program in Logistics
Computing the Value of the Maximum Likelihood Estimate of the Parameter of a Poisson Distribution Truncated below One,
Rosedith Sitgreaves. 8 Aug 75, 20p Rept no. Serial-T-310
Contract N00014-75-C-0729

Descriptors: *Poisson density functions, *Distribution functions, *Mathematical models, *Logistics, Parameters, Graphics, Tables(Data), Computations, Truncation, Estimates, Inventory control.
Identifiers: *Maximum likelihood estimates.

In attempting to predict the number of demands occurring in a given interval of time for supplies in military inventory systems, it is useful to examine probability models for the distribution of demands for individual items of supply. A first approach in model building for this problem has been to assume that the distribution of demands for a given item is a Poisson distribution, with parameter. However, when Poisson distributions have been fitted to available data, it has been found in many cases that this model tends seriously to underestimate the frequency of periods in which no demands occur. A more general approach is to postulate the existence of two random mechanisms, one governing the occurrence or non-occurrence of demands in the given time period, and the other governing the specific number of demands made, given that demands occur.

AD-A015 700/8GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Statistics
A Note on a Sequential Selection Procedure with Applications to Regression Analysis.
Technical rept.,
Deng-Yuan Huang. Sep 75, 9p Rept no. Mimeograph Ser-439
Contract N00014-75-C-0455
Prepared in cooperation with Academia Sinica, Taipei (Taiwan).

Descriptors: *Sequential analysis, *Regression analysis, Sampling, Mathematical models, Selection.
Identifiers: *Subset selection.

In the past decade a number of fixed sampling methods have been developed for selecting the 'best' or at least a 'good' subset of variable in regression analysis. The author is interested in deriving a sequential selection procedure to select a subset of a random size including all good regression equations.

AD-A015 701/6GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Statistics
Nonparametric Selection Procedures for Selecting the Regression Equations with Larger Slope.
Technical rept.,
Shanti S. Gupta, and Deng-Yuan Huang. Sep 75, 11p Rept no. Mimeograph Ser-438
Contract N00014-75-C-0455
Prepared in cooperation with Academia Sinica, Taipei (Taiwan).

Descriptors: *Nonparametric statistics, *Regression analysis, Sampling, Estimates, Distribution functions.
Identifiers: *Subset selection.

Assume that the equation w = (beta sub 0) + (beta sub 1)t describes the weight of animals that have been fed a new ration for a given time t. The weight w is in grams, and the time t is in weeks. The model will be written y = (beta sub 0) + (beta sub 1)t + e, where (beta sub 0) is the initial weight of an animal and (beta sub 1) is the growth rate. The authors are interested in knowing what kind of ration has the largest growth rate among a set of rations. Applications of these results to animal science, economics and other fields can be made.

AD-A015 703/2GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Becton Center
On the Stability of Non-Autonomous Differential Equations dx/dt = (A + B(t))x, with Skew-Symmetric Matrix B(t).
Technical rept.,
A. P. Morgan, and K. S. Narendra. Aug 75, 23p Rept no. CT-66
Contract N00014-67-A-0097-0020
Report on Control Theory.

Descriptors: *Matrices(Mathematics), *Differential equations, *Control theory, Linear systems, Theorems.
Identifiers: Asymptotic stability, Automatic control.

No abstract available.

AD-A015 714/9GA PC$3.75/MF$2.25
North Carolina Univ At Chapel Hill Dept of Statistics
On the Asymptotic Behavior of Certain Sums of Probabilities.
Technical rept.,
Walter L. Smith. Aug 75, 40p Rept no. Mimeo Ser-1026
Contract N00014-75-C-0809

Descriptors: *Probability, *Asymptotic series, Convergence, Analysis of variance, Theorems, Random variables.

No abstract available.

AD-A015 760/2GA PC$3.25/MF$2.25
Brown Univ Providence R I Lefschetz Center for Dynamical Systems
Topological Dynamics of an Ordinary Differential Equation,
Zvi Artstein. 31 Oct 74, 18p
Contract N00014-67-A-0191-0009, Grant NSF-GP-28931

Descriptors: *Differential equations, Topology, Mapping(Transformations), Theorems.
Identifiers: *Ordinary differential equations.

This is a technical paper that relaxes the conditions under which the mapping Pi(t,(X sub 0),f) = (phi(t,(X sub 0),f),(f sub t)) is a dynamical system, where phi(t,(x sub 0),f) is the solution of dx/dt = f(x,t),x(0) = (x sub 0), and (f sub t) is defined by (f sub t)(x,s) = f(x,t+s). The fact that Pi is a dynamical system has many consequences, including the validity of the LaSalle invariance principle in stability for the nonautonomous system dx/dt = f(x,t). So by casing the conditions the author automatically improves many results.

AD-A015 772/7GA PC$3.25/MF$2.25
Princeton Univ N J Dept of Statistics
The Inefficiency of Least Squares,
Peter Bloomfield, and Geoffrey S. Watson. Jan 74, 8p
Availability: Pub. in Biometrika, v62 n1 p121-128 1975.

Descriptors: *Least squares method, *Eigenvectors, Regression analysis, Efficiency, Transformations(Mathematics), Reprints.

No abstract available.

AD-A015 777/6GA PC$3.25/MF$2.25
Frank J Seiler Research Lab United States Air Force Academy Colo
Performance Evaluation of Suboptimal Filters,
Robert B. Asher, and Richard M. Reeves. 5 Feb 73, 9p Rept no. FJSRL-TR-75-0015
Availability: Pub. in IEEE Transactions on Aerospace and Electronic Systems, vAES-11 n3 p400-405 May 75.

Descriptors: *Kalman filtering, Mathematical models, Estimates, Errors, Covariance, Model theory, Matrices(Mathematics), Feedback, Control systems, Reprints.
Identifiers: Suboptimal filters, Reduced state, Estimation theory.

The use of a Kalman filter in an applications problem requires a detailed model of both the system dynamics and the measurement dynamics. The model for many problems may be extremely large in dimensionality. However, in many instances one has a limited computer capability and, thus, must purposely introduce modeling errors into the filter in order to gain a computational advantage. However, as is well known, this may lead to the phenomenon of filter divergence. This paper considers the development of equations which allow one to evaluate a filter of reduced state. The equations are based upon using covariance analysis techniques in order to determine the true root-mean-square estimation error. These equations are computationally more advantageous than others appearing in the literature. (Author)

AD-A015 782/6GA PC$3.25/MF$2.25
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering

On a Class of Computationally Efficient Feature Selection Criteria,
Chi-Hau Chen. 11 Apr 74, 9p AFOSR-TR-75-1410
Grant AF-AFOSR-2119-71
Availability: Pub. in Pattern Recognition, v7 p87-94 1975.

Descriptors: *Algorithms, Pattern recognition, Errors, Computer programs, Selection rules(Physics), Probability, Sequential analysis, Reprints.

This paper considers the computation problems in feature selection. A recursive computation procedure is presented for feature selection and ordering by using the indirect measures such as the Bhattacharyya distance and mutual information. Both binary and quantized measurements are considered. Supporting computer results are provided. (Author)

AD-A015 783/4GA PC$3.25/MF$2.25
California Univ Santa Barbara Inst for the Interdisciplinary Applications of Algebra and Combinatorics
Rearrangement and Extremal Results for Hermitian Matrices,
Marvin Marcus. 1 Jul 74, 11p AFOSR-TR-75-1443
Grant AF-AFOSR-2164-72
Availability: Pub. in Linear Algebra and Its Applications 11, p95-104 1975.

Descriptors: *Matrices(Mathematics), *Eigenvectors, Inequalities, Complex variables, Linear algebra, Reprints.

This paper contains extreme value results for concave and convex symmetric functions of the eigenvalues of B + R* AP as functions of the partial isometry P. The matrices A and B are Hermitian. The results are proved using theorems of Lidskii and Wielandt, the Cauchy interlacing inequalities, the Birkhoff theorem for doubly stochastic matrices, certain convexity results for functions, and some new rearrangement theorems proved in the paper. (Author)

AD-A015 784/2GA PC$3.25/MF$2.25
California Univ Santa Barbara Inst for the Interdisciplinary Applications of Algebra and Combinatorics
Spectra of Irreducible Matrices,
Henryk Minc. 10 Sep 73, 7p AFOSR-TR-75-1441
Grant AF-AFOSR-2164-72
Availability: Pub. in Proceedings of the Edinburgh Mathematical Society, v19 Series II Part 3 p231-236 Mar 75.

Descriptors: *Matrices(Mathematics), Theorems, Eigenvectors, Reprints.
Identifiers: Irreducible matrices.

No abstract available.

AD-A015 785/9GA PC$3.25/MF$2.25
California Univ Santa Barbara Inst for the Interdisciplinary Applications of Algebra and Combinatorics
A Note on the Hodge Star Operator,
Marvin Marcus, and Herbert Robinson. 6 Mar 74, 4p AFOSR-TR-75-1442
Grant AF-AFOSR-2164-72
Availability: Pub. in Linear Algebra and Its Applications, 10 p85-87 1975.

Descriptors: *Operators(Mathematics), *Linear algebra, Vector spaces, Reprints.
Identifiers: Hodge star operator, Grassmann algebra.

The usual proof that the Hodge star operator on the Grassmann algebra is independent of the orthornormal basis used to define it requires a decomposition of the operator into a product of three maps, each of which is independent of the basis. The present note contains a very short proof of the result which depends on simple properties of the multiplication and induced inner product in the Grassmann algebra. (Author)

AD-A015 788/3GA PC$3.75/MF$2.25
Michigan State Univ East Lansing Dept of Mathematics
Uniform Rational Approximation of Functions of Several Variables,
E. H. Kaufman, Jr., and G. D. Taylor. 14 Dec 73, 28p AFOSR-TR-75-1456
Grant AF-AFOSR-2271-72
Availability: Pub. in International Jnl. for Numerical Methods in Engineering, v9 p297-323 1975.

Descriptors: *Rational functions, *Approximation(Mathematics), *Complex variables, Computer programs, FORTRAN, Algorithms, Linear programming, Differential equations, Reprints.
Identifiers: Uniform fit.

This paper gives a description and Fortran listing of a program that gives a uniform fit to a given finite data set by polynomials rational functions generalized polynomials or generalized rational functions. This method used is a linear programming approach known as the differential correction algorithm and has given excellent results in many test cases. (Author)

AD-A015 792/5GA PC$3.25/MF$2.25
California Univ Berkeley
Martingales on Jump Processes. I: Representation Results,
R. Boel, P. Varaiya, and E. Wong. 12 Jan 73, 24p ARO-7144.37-EL
Contract DAHC04-67-C-0046, Grant NSF-GK-10656X3
See also AD-A015 793.
Availability: Pub. in SIAM Jnl. of Control, v13 n5 p999-1021 Aug 75.

Descriptors: *Stochastic processes, *Poisson density functions, Integrals, Control theory, Probability, Information theory, Transformations(Mathematics), Reprints.
Identifiers: *Martingale theory.

The paper is a contribution to the theory of martingales of processes whose sample paths are piecewise constant and have finitely many discontinuities in a finite time interval. The assumption is made that the jump times of the underlying process are totally inaccessible and necessary and sufficient conditions are given for this to be true. It turns out that all martingales are then discontinuous, and can be represented as stochastic integrals of certain basic martingales. This representation theorem is used in a companion paper to study various practical problems in communication and control. The results in the two papers constitute a sweeping generalization of recent work on Poisson processes. (Author)

AD-A015 793/3GA PC$3.75/MF$2.25
California Univ Berkeley
Martingales on Jump Processes. II: Applications,
R. Boel, P. Varaiya, and E. Wong. 21 Dec 73, 41p ARO-7144.43-EL
Contract DAHC04-67-C-0046, Grant NSF-GK-10656X3
See also AD-A015 792.
Availability: Pub. in SIAM Jnl. of Control, v13 n5 p1022-1061 Aug 75.

Descriptors: *Stochastic processes, *Poisson density functions, Integrals, Control theory, Probability, Information theory, Transformations(Mathematics), Reprints.
Identifiers: Martingale theory.

This paper is concerned with applying the theory of martingales of jump processes to various problems arising in communication and control. It parallels the approaches which have been recently discovered in dealing with similar problems where the underlying stochastic process is Brownian motion. Indeed these approaches have recently been extended, starting with the work of Snyder and Bremaud to the case of the Poisson process and its transformations. The paper can then be regarded as a sweeping generalization to this recent work.

AD-A015 851/9GA PC$3.75/MF$2.25
California Univ Los Angeles Dept of System Sciences
On a Causal and Causally Invertible Representation of Equivalent Gaussian Processes.
Interim rept.,
M. Hitsuda, and H. Watanabe. 1975, 32p
AFOSR-TR-75-1374
Grant AF-AFOSR-2492-73

Descriptors: *Stochastic processes, Measure theory, Random variables, Theorems.
Identifiers: *Gaussian processes, Wiener processes.

No abstract available.

AD-A015 909/5GA PC$3.25/MF$2.25
Southern Methodist Univ Dallas Tex Dept of Statistics
Selecting a Regression Estimator with Integrated Mean Squared Error as a Criterion.
Interim rept.,
Robert L. Mason, and Richard F. Gunst. 1975, 23p AFOSR-TR-75-1395
Grant AF-AFOSR-2871-75

Descriptors: *Regression analysis, Mathematical prediction, Estimates, Analysis of variance.

Integrated mean squared error is employed as a criterion for choosing an estimator of a multiple linear regression model when the regressor variables are multicollinear. Three estimators of the regression coefficients are examined: ordinary least squares, principal components regression, and ridge regression. The integrated variance and integrated squared bias of the corresponding prediction equations are evaluated for a general class of weight functions. Comparisons of the predictors are made on the basis of integrated variance and squared bias separately and combined as integrated mean squared error.

AD-A015 911/1GA PC$3.25/MF$2.25
Florida State Univ Tallahassee Dept of Statistics
Inconsistency of Maximum Likelihood Estimator of Distributions Having Increasing Failure Rate Average,
F. Proschan, and A. W. Marshall. Sep 75, 12p
Rept nos. FSU-Statistics-M350, TR-48 AFOSR-TR-75-1420
Grants AF-AFOSR-2581-74, NSF-MPS74-15239
Prepared in cooperation with British Columbia Univ., Vancouver.

Descriptors: *Reliability, *Statistical analysis, Failure, Estimates, Sampling, Distribution functions.
Identifiers: *Maximum likelihood estimation, *Failure rate functions, Order statistics.

Marshall and Proschan showed that the MLE for a life distribution with increasing failure rate is strongly consistent (Ann. Math. Statist., 1965, 36, 69-77). In this note the author shows that the MLE for a life distribution with increasing failure rate average is not consistent; in fact, maximum likelihood estimation in the IFRA case yields estimators of the average failure rate and of the distribution function which, in general, coverage a.s. to values other than the

true values. In the decreasing failure rate average case, the MLE fails to exist.

AD-A015 916/0GA PC$3.25/MF$2.25
California Univ Los Angeles Dept of System Sciences
Stochastic Control of Systems Governed by Partial Differential Equations.
Interim rept.,
A. V. Balakrishnan. Aug 75, 16p AFOSR-TR-75-1377
Grant AF-AFOSR-2492-73

Descriptors: *Control theory, Linear systems, Stochastic processes, Partial differential equations, White noise, Mathematical models.
Identifiers: *Stochastic control, Wiener processes, Semigroup theory.

A theory is given of stochastic control (Linear Quadratic Regulator) of systems governed by partial differential equations featuring both control and random disturbance on the boundary, exploiting the theory of semigroups of linear operators and using white noise theory in place of Wiener process theory.

AD-A015 927/7GA PC$3.25/MF$2.25
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Periodic Control of Vehicle Cruise: Improved Fuel Economy by High and Low Frequency Switching.
Interim rept.,
Elmer G. Gilbert. Apr 75, 11p AFOSR-TR-75-1337
Grant AF-AFOSR-2517-73
Also pub. in Proceedings of the Conference on Information Sciences and Systems, Baltimore, Md., Apr 75 p 289-296.

Descriptors: *Vehicles, *Fuel consumption, *Control theory, Mathematical models, Theorems, Steady state, Aircraft, Ships.
Identifiers: *Fuel economy, *Automatic control.

It is shown that time-dependent periodic control can improve the fuel economy of vehicles in cruise. The time-dependent controls considered are relaxed steady-state (RSS) control, quasi-steady-state (QSS) control, and quasi-relaxed steady-state (QRSS) control. Examples are given which show that QRSS control may give better performance than either RSS or QSS control. Properties of optimal cost functions (dependent on the minimum required average speed) are derived. The possibility or impossibility of improved performance through the use of QRSS, QSS, and RSS control is investigated in terms of assumptions on the vehicle drag and fuel-consumption functions.

AD-A015 949/1GA PC$3.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
The Eigensystem Capability of Four Subroutine Libraries Available at DTNSRDC.
Research and development rept.,
Donald A. Gignac. Jul 75, 27p Rept no. NSRDC-4710

Descriptors: *Eigenvectors, *Algorithms, Subroutines, Matrices(Mathematics), Fortran, Libraries.
Identifiers: Eigenvalues, Eigensystems.

The need to compute eigenvalues and eigenvectors arises frequently in applied work in the Navy's varied research program. For a given eigensystem problem several algorithms (methods) may be considered and for a given algorithm several Fortran subroutine implementations may be available to choose from. This report offers help in choosing among the options available at DTNSRDC for the solution of eigensystem problems.

AD-A015 971/5GA PC$3.25/MF$2.25
Southern Methodist Univ Dallas Tex Dept of Statistics
On Cornish-Fisher Expansions with Unknown Cumulants.
Technical rept.,
E. D. McCune, and H. L. Gray. 30 May 75, 16p Rept no. TR-123
Contract N00014-75-C-0439

Descriptors: *Statistical analysis, Series(Mathematics), Probability density functions, Matrices(Mathematics), Theorems.
Identifiers: *Cornish-Fisher series, Quantiles.

In this paper a new method of approximating the quantiles of one distribution by the quantiles of another is introduced. The method is essentially a modification of the Cornish-Fisher technique which eliminates the necessity of knowing the cumulants of the distribution involved.

AD-A016 031/7GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Statistics
Subset Selection Procedures for Regression Analysis.
Technical rept.,
Shanti S. Gupta, and Deng-Yuan Huang. Sep 75, 14p Rept no. Mimeograph Ser-437
Contract N00014-75-C-0455
Prepared in cooperation with Academia Sinica, Taipei (Taiwan).

Descriptors: *Regression analysis, Normal density functions, Matrices(Mathematics), Analysis of variance.
Identifiers: *Subset selection.

In the past decade a number of methods have been developed for selecting the 'best' or at least a 'good' subset of variables in regression analysis. For various reasons, one may be interested in selecting a random size subset excluding all inferior independent variables. The authors are interested in deriving a selection procedure to the goal. Some results on the efficiency of the procedure are also discussed.

AD-A016 033/3GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Statistics
Subset Selection Procedures in Analysis of Variance.
Technical rept.,
Shanti S. Gupta, and Deng-Yuan Huang. Sep 75, 20p Rept no. Mimeograph Ser-436
Contracts N00014-67-A-0226-0014, N00014-75-C-0455
Prepared in cooperation with Academia Sinica, Taipei (Taiwan).

Descriptors: *Analysis of variance, Sampling, Matrices(Mathematics), Normal density functions.
Identifiers: *Subset selection.

In most of the practical situations to which the analysis of variance tests are applied, they do not supply the information that the experimenter aims at. If, for example, the hypothesis is rejected in actual application of the F-test, the resulting conclusion that the true means (theta sub 1), (theta sub 2),...,(theta sub k) are not all equal, would by itself usually the insufficient to satisfy the experimenter. In fact his problems would begin at this stage. He may desire to select the 'best' population or a subset of the 'best' populations; he may like to rank the populations in order of 'bestness' or he may like to draw some other inferences about the parameters of interest to him. The authors interest lies in selecting a non-empty subset of the k populations containing the 'best' population as ranked in terms of (theta sub i's).

AD-A016 060/6GA PC$3.75/MF$2.25
Brown Univ Providence R I Div of Applied Mathematics
Invariants and Canonical Forms under Dynamic Compensation,
W. A. Wolovich, and P. L. Falb. Aug 75, 31p
AFOSR-TR-75-1375
Grants AF-AFOSR-2078-71, NSF-ENG73-03846-A01

Descriptors: *Matrices(Mathematics), Linear systems, Invariance, Theorems.
Identifiers: *Canonical forms.

This paper is concerned with the development of a complete abstract invariant as well as a set of canonical forms under dynamic compensation for linear systems characterized by proper, rational transfer matrices. More specifically, it is shown that one can always associate with any proper rational transfer matrix, T(s), a special lower left triangular matrix, (Xi sub T)(s), called the interactor. This matrix is then shown to represent an abstract invariant under dynamic compensation which, together with the rank of T(s), represents a complete abstract invariant. A set of canonical forms under dynamic compensation is also developed along with appropriate dynamic compensation.

AD-A016 075/4GA PC$3.25/MF$2.25
Colorado State Univ Fort Collins Dept of Computer Science
Dual Orthogonal Series: An Abstract Approach,
Robert P. Feinerman, and Robert B. Kelman. 11 Mar 75, 6p ARO-11496.3-M
Grant DAHC04-74-G-0140
Availability: Pub. in Bulletin of the American Mathematical Society, v81 n4 p733-736 Jul 75.

Descriptors: *Series(Mathematics), Orthogonality, Approximation(Mathematics), Hilbert space, Operators(Mathematics), Reprints.

No abstract available.

AD-A016 076/2GA PC$3.25/MF$2.25
Colorado State Univ Fort Collins Dept of Computer Science
An Algorithm for Solving a Dual Cosine Series,
Robert B. Kelman, and J. Timothy Simpson. Sep 74, 7p ARO-11496.2-M
Grant DAHC04-74-G-0140
Availability: Pub. in Comp. and Maths. with Appls. v1 p195-199 1975.

Descriptors: *Trigonometry, *Algorithms, *Series(Mathematics), Fourier analysis, Orthogonality, Reprints.
Identifiers: *Trigonometric series, *Cosine series.

Solutions to dual trigonometric series are frequently given as double singular integrals, which are not conducive to automatic numerical evaluation. It is suggested that by performing a preliminary Fourier analysis on the data, the double singular integrals can be eliminated, and the solutions reduced to a finite number of precisely specified elementary arithmetic operations. This technique is used to reduce to an algorithm the analytic solution to a dual cosine series which had earlier been derived by the method of orthogonality relations. Some computational results are also presented. (Author)

AD-A016 082/0GA PC$3.25/MF$2.25
California Univ Los Angeles
Biharmonic Green's Functions and Harmonic Degeneracy,
Leo Sario. 17 Apr 74, 15p ARO-9653-64-M
Grant DA-ARO-D-31-124-73-G39
Availability: Pub. in Jnl. of Mathematics of Kyoto University, v15 n2 p351-362, 17 Apr 74.

Descriptors: *Green's function, *Harmonic analysis, *Differential topology, Operators(Mathematics), Reprints.
Identifiers: *Harmonic functions.

The harmonic and biharmonic classification theories of Riemannian manifolds have developed in somewhat opposite directions. In harmonic classification theory, the existence of the Green's function was first explored, and then its relations to various harmonic null classes established. In biharmonic classification theory, a rather complete array of relations between quasiharmonic and biharmonic null classes has been developed, without any reference to biharmonic Green's functions. The reason is that no explicit tests for the existence of these functions have been known. Such tests have recently been found for biharmonic Green's function upsilon which, roughly speaking, satisfy the conditions upsilon=delta upsilon=0 on the ideal boundary of the Riemannian manifold.

AD-A016 088/7GA PC$3.25/MF$2.25
California Univ Los Angeles
Bounded Biharmonic Functions on the Poincare N-Ball,
Dennis Hada, Leo Sario, and Cecilia Wang. 16 Nov 73, 18p ARO-9653.56-M
Grant DA-ARO-D-31-124-73-G39
Availability: Pub. in Kodai Mathematical Seminar Reports, v26 n2/3 p327-342 Mar 75.

Descriptors: *Functions(Mathematics), *Harmonic analysis, Differential geometry, Differential topology, Transformations(Mathematics), Reprints.
Identifiers: *Bounded functions, *Riemannian manifolds, *Biharmonic functions.

The existence of bounded biharmonic functions has remained an open problem. The difficulty lies in the fact that the space of these functions is not a Hilbert space. The purpose of the present paper is to give a complete solution to this problem. It will be necessary to divide the investigation into the following eight cases, which require a variety of different methods. (Author)

AD-A016 100/0GA PC$3.75/MF$2 25
Wisconsin Univ Madison Mathematics Research Center
Analysis of a Degree Compatibility Test for Polynomial Irreducibility.
Technical summary rept.,
David R. Musser. May 75, 39p Rept no. MRC-TSR-1507
Contract DA-31-124-ARO(D)462, Grant NSF-GJ-30125

Descriptors: *Prime numbers, Number theory, Polynomials, Markov processes, Computations.
Identifiers: *Markov chains.

Polynomials with integer coefficients can often be proved irreducible by considering the degrees of factors obtained modulo several different primes. This paper presents an algorithm based on this idea and analyzes the number of primes, N, required. The results show that mean (N) grows very slowly with n and is less than 5 for all < or = 200.

AD-A016 101/8GA PC$3.25/MF$2.25
Wisconsin Univ Madison Mathematics Research Center
A Derangement Problem.
Technical summary rept.,
Richard Askey, Mourad Ismail, and Thanaa Rashed. Jun 75, 15p Rept no. MRC-TSR-1522
Contract DA-31-124-ARO-D-462, Grant NSF-GP-33897

Descriptors: *Probability, Polynomials, Hypergeometric functions, Theorems.
Identifiers: Laguerre functions, *Derangement problem.

Even and Gillis found a closed form solution to a derangement problem of (n sub 1) + ... + (n sub k) objects where (n sub i) objects are of type i. Their solution was an integral of products of Laguerre polynomials. A new derivation is given using MacMahon's master theorem and an asymptotic agrument is given to estimate the size of the number of derangements when (n sub 1 = ... = (n sub k) and k is large. The authors also show how Even and Gillis' integral representation follows easily from Kaplansky's symbolic representation of these numbers.

AD-A016 211/5GA PC$3.25/MF$2.25
Iowa State Univ Ames
On Most Effective Tournament Plans with Fewer Games than Competitors,
Willi Maurer. Sep 73, 13p ARO-11259.6-M
Grant DA-ARO-D-31-124-73-G55
Availability: Pub. in the Annals of Statistics, v3 n3 p717-727 1975.

Descriptors: *Game theory, *Probability, *Set theory, Matrices(Mathematics), Functions(Mathematics), Sequences(Mathematics), Reprints.
Identifiers: *Tournaments.

General random tournament designs are introduced. A tournament plan on a set of players is a rule that generates a sequence of games with the game to be played or termination of the sequence depending only on the outcomes of previous games. In a k.o. plan a player is eliminated from the tournament if he loses a game. The interpretation of tournament plans as mappings with digraphs as domain and range proves to be useful to show the superiority of k.o. plans over other plans with the same fixed number of games in finding the 'best' among n players.

AD-A016 228/9GA PC$3.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Optimal Use of Information in Certain Iterative Processes,
Robert Meersman. Jul 75, 18p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111

Descriptors: *Analytic functions, *Iterations, Permutations, Set theory, Matrices(Mathematics), Theorems, Approximation(Mathematics), Numerical analysis.

To approximate numerically a zero alpha of a real analytic function f, f(alpha) = 0, iteration is most widely used. In this report the author discusses so-called k-point stationary iterative processes without memory.

AD-A016 232/1GA PC$6.25/MF$2.25
Stanford Univ Calif Dept of Statistics
Asymptotic Properties of Some Estimators in Moving Average Models.
Technical rept.,
Raul Pedro Mentz. 8 Sep 75, 157p Rept no. TR-21
Contract N00014-75-C-0442

Descriptors: *Time series analysis, Estimates, Mathematical models, Asymptotic series, Autocorrelation, Theorems.
Identifiers: *Moving average, Maximum likelihood estimation, Asymptotic normality.

The author considers estimation procedures for the moving average model of order q. Walker's method uses k sample autocovariances (k > or = q). Assume that k depends on T in such a way that k nears infinity as T nears infinity. The estimates are consistent, asymptotically normal and asymptotically efficient if k = k (T) dominates log T and is dominated by (T sub 1/2). The approach in proving these theorems involves obtaining an explicit form for the components of the inverse of a symmetric matrix with equal elements along its five central diagonals, and zeroes elsewhere. The asymptotic normality follows from a central limit theorem for normalized sums of random variables that are dependent of order k, where k tends to infinity with T. An alternative form of the estimator facilitates the calculations and the analysis of the role of k, without changing the asymptotic properties.

AD-A016 234/7GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
On the Risk-Sensitive Optimality Criteria for Markov Decision Processes.
Technical rept.,
Karel Sladky. 15 Jun 75, 25p Rept no. TR-30
Contract N00014-75-C-0493, Grant NSF-ENG-74-12378

Descriptors: *Decision theory, *Dynamic programming, Risk, Stochastic processes, Recursive functions, Theorems.
Identifiers: *Markov decision processes, Utility functions.

Discrete dynamic programming models with an exponential utility function are studied with respect to the asymptotic behavior of the dynamic programming recursion for the expected utility. Preliminary results on maximizing the asymptotic growth of the expected utility in the class of stationary policies are presented. Under the condition that there exists a stationary 'optimal' policy with an irreducible, aperiodic transition probability matrix, some nice limiting properties for the maximum expected utilities are established. Moreover, it is shown how to generate a monotonic sequence of lower and upper bounds on the maximum growth rate of the expected utility. Under certain additional assumptions it is possible to extend the obtained results to Markov decision processes with a denumerable state space.

AD-A016 237/0GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
A Poisson Convergence Theorem for a Particle System with Dependent Motions.
Technical rept.,
P. A. Jacobs. Jun 75, 21p Rept no. TR-75-15
Contract N00014-75-C-0267

Descriptors: *Stochastic processes, Clustering, Particles, Convergence, Theorems.
Identifiers: Poisson processes.

No abstract available.

AD-A016 238/8GA PC$3.75/MF$2.25
Stanford Univ Calif Dept of Operations Research
Point Processes Attached to a Markov Process by a Markov Additive Process.
Technical rept.,
P. A. Jacobs. Dec 74, 26p Rept no. TR-74-24
Contract N00014-67-A-0112-0011

Descriptors: *Markov processes, Measure theory, Random variables, Theorems.
Identifiers: *Point processes.

No abstract available.

AD-A016 247/9GA PC$3.75/MF$2.25
Princeton Univ N J Dept of Statistics
Simultaneous t-Tests in Normal Models.
Technical rept.,
David Hunter. Jun 75, 28p Rept no. TR-87-Ser-2
Contract N00014-75-C-0453

Descriptors: *Statistical tests, *Confidence limits, Normal density functions, Regression analysis, Hypotheses.
Identifiers: *T test.

No abstract available.

IS-T-675 PC$8.75/MF$2.25
Ames Lab., Iowa.
Iterative Method for Fredholm Equations of the First Kind.
W. C. Peterson. May 75, 115p
Contract W-7405-eng-82

Descriptors: (*Fredholm equation, *Iterative methods), Algorithms, Computer codes, Errors, Integral equations, Least square fit, Series expansion.

For abstract, see NSA 32 08, number 21793.

NTIS/PS-75/776/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Experimental Design (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
David W. Grooms. Oct 75, 117p*
Supersedes NTIS/PS-75/066.

Descriptors: *Bibliographies, *Experimental design, Block design, Latin squares, Applications of mathematics, Combinatorial analysis.
Identifiers: Connected design, Knut Vik design, Factorial design, Baer design, Youden design.

The bibliography cites research on methods and theory necessary in experimental design. Included are studies on block design, latin squares, connected design, Knut Vik design, factorial design, Baer design, and Youden design. (Contains 112 abstracts).

N75-30839/5GA PC$3.25/MF$2.25
Ohio State Univ. Research Foundation, Columbus. Dept. of Aeronautics and Aeronautical Engineering.
The Application of the General Energy Equation: A Unified Approach to Mechanics.
Final Report, 1 Apr. 1973 - 31 Aug. 1975.
C. D. Bailey. 29 Aug 75, 14p NASA-CR-143346
Contract NGR-36-008-197
Subm-Submitted for Publication.

Descriptors: *Hamiltonian functions, *Ritz averaging method, *Variational principles, Classical mechanics, Quantum theory, Thermal stresses.

For abstract, see STAR 1321

N75-30841/1GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
On the Asymptotic Properties of the Solutions of the Third-Order Linear Differential Equation.
M. Gregus. Sep 75, 15p NASA-TT-F-16539
Contract NASW-2790
Tran-Transl. Into English from Ann. Mat. Pura Appl. (Italy), Series 4, V. 63, 1963 p 1-10.

Descriptors: *Asymptotes, *Differential equations, *Problem solving, Linear equations, Numerical analysis, Real numbers.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30860/1GA PC$3.25/MF$2.25
Sheffield Univ. (England). Dept. of Probability and Statistics.
Stable Sequences and the Random Indices Limit Problem.
D. J. Scott. Sep 74, 20p RR-158/DJS-1

Descriptors: *Limits (Mathematics), *Random numbers, *Sequential control, Function space, Probability theory, Theorem proving.

For abstract, see STAR 1321

N75-30861/9GA PC$3.75/MF$2.25
Rice Univ., Houston, Tex. Dept. of Mathematical Sciences.
Nonparametric Maximum Likelihood Estimation of Probability Densities by Penalty Function Methods.
G. F. Demontricher, R. A. Tapia, and J. R. Thompson. Aug 74, 37p NASA-CR-144384, REPT-275-025-016
Contracts NAS9-12776, NR PROJ. 042-283
Subm-Sponsored by Onr. Conf-Presented at 37TH Ann. Meeting of the Inst. Of Mathematical Statistics, Edmonton, Canada, 15 Aug. 1974.

Descriptors: *Maximum likelihood estimates, *Probability density functions, Hilbert space, Histograms, Theorems.

For abstract, see STAR 1321

12B. Operations Research

AD-A015 806/3GA PC$3.75/MF$2.25
Florida Univ Gainesville Dept of Industrial and Systems Engineering
Minimax Multifacility Location with Euclidean Distances (Revised).
Research rept.,
Jack Elzinga, Donald Hearn, and William D. Randolph. Jun 75, 26p Rept no. RR-75-4 ARO-10841.1-M
Grants DA-ARO-D-31-124-75-G149, NSF-ENG-74-22159
Supersedes AD-766 856. Prepared in cooperation with Johns Hopkins Univ., Baltimore, Md. and Decisions and Designs, Inc., McLean, Va.

Descriptors: *Nonlinear programming, Minimax technique, Computations, Matrices(Mathematics), Optimization, Computer applications.
Identifiers: *Location problems, Duality theory.

The problem considered is that of locating N new facilities among M existing facilities with the objective of minimizing the maximum weighted Euclidean distance among all facilities. The application of nonlinear duality results show that this problem can always be solved by maximizing a continuously differentiable concave objective subject to a small number of linear constraints. This leads to a solution procedure which produces very good numerical results. Computational results are reported.

AD-A015 908/7GA PC$5.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
The Principles of Cutting-Plane Theory. Part II. Algebraic Methods, Disjunctive Methods.
Management Sciences Research rept.,
Robert G. Jeroslow. Aug 75, 117p Rept no. RR-37Q
Contract N00014-67-A-0314-0007, Grant NSF-GP-37510
See also Part 1 dated Mar 74, AD-779 955.

Descriptors: *Integer programming, Linear programming, Matrices(Mathematics), Inequalities, Convex sets, Theorems, Optimization.
Identifiers: *Cutting plane method, Duality theory.

In this paper the author, surveys the algebraic and disjunctive methods, and includes several new results, such as finiteness proofs for new classes of cuttingplane algorithms, a subadditive algorithm for integer programs, and sharpened results on subadditive dual programs, plus other theorems. The author has tried to bring together many of the most quoted results in the theory of integer programming, to provide the most concise proofs for these of which he is aware, and to show the interrelations between these results.

AD-A015 918/6GA PC$3.75/MF$2.25
University of Southern California Los Angeles Dept of Quantitative Business Analysis
Linear Programming with Linked Lists and Automatic Guberization.
Working paper,
Richard D. McBride. Jul 75, 29p Rept no. USC-WP-8175 AFOSR-TR-75-1289
Grant AF-AFOSR-2715-74

Descriptors: *Linear programming, Matrices(Mathematics), Algorithms.
Identifiers: Duality theory, Constraints.

Linked Lists are used to carry the nonzero elements of the basis inverse in the execution of a linear programming algorithm. The number of nonzero elements needed to execute the algorithm can be reduced by: (1) Using the kernel (a submatrix of the basis inverse); (2) Converting the problem to an equivalent generalized GUB problem; (3) Using a new method to carry range restricted constraints. Computational results indicate that basis inverses are not as dense as commonly assumed; the density is related to the density of the conflict matrix corresponding to the coefficient matrix; the nonzero buildup can be significantly reducing using the method noted above. A comparison of algorithms used to locate disjoint subsets of constraints is made.

AD-A015 922/8GA PC$3.25/MF$2.25
George Washington Univ Washington D C Inst for Management Science and Engineering
Some Results Useful for Bounding the Global Minimum of a Function,
Louis J. Mancini, and Garth P. McCormick. 3 Jul 75, 10p Rept no. Serial-T-317 AFOSR-TR-75-1264
Grant AF-AFOSR-2504-73

Descriptors: *Functions(Mathematics), *Optimization, Convex sets, Theorems.

Conditions are given which are sufficient to prove the existence of a unique unconstrained minimizer in a convex compact set. An exact formula is given for the amount by which a value of the function exceeds its global minimum.

AD-A016 180/2GA PC$5.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
On Large-Scale Linear Programming.
Technical rept.,
Markku Juhani Kallio. Apr 75, 119p Rept no. SOL-75-7
Contracts N00014-75-C-0865, AT(04-3)-326

Descriptors: *Linear programming, Dynamic programming, Simplex method, Matrices(Mathematics), Computations, Algorithms, Theses.

Three classes of methods are proposed for solving large-scale linear programs. First, sequential projection is applied to reformulate the linear program as a dynamic program. Second, the revised simplex method using a special factorization for the basis is considered. Third, a class of feasible direction methods is presented. A comparison of these three classes is made. A probabilistic model is developed to estimate computational effort for matrix multiplications. This model is applied to estimate computational effort for linear programming algorithms.

AD-A016 183/6GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab

An Accuracy Test for Updating Triangular Factors.
Technical rept.,
J. A. Tomlin. Apr 75, 9p Rept no. SOL-75-9
Contracts N00014-75-C-0865, DAHC04-74-C-0034

Descriptors: *Linear programming, Matrices(Mathematics), Computations.
Identifiers: Error analysis, *Forrest-Tomlin method.

This note describes a new accuracy test for the Forrest-Tomlin method for updating triangular factors of the basis, based on standard error analysis techniques. This test has proved very useful in practice when the method is applied to digitally unstable models.

AD-A016 188/5GA PC$8.50/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Parametric Techniques for Multistage Stochastic Allocation.
Technical rept.,
Robert E. Doherty. Aug 75, 258p Rept no. SOL-75-19
Contracts N00014-75-C-0267, AT(04-3)-326

Descriptors: *Allocations, *Stochastic processes, *Mathematical programming, Decision making, Mathematical models, Computer programs, FORTRAN.
Identifiers: Utility theory, Resource allocation, FORTRAN 4 programming language.

This paper treats a problem of multistage allocation under conditions of risk. After qualitative features of the problem are discussed, an efficiency procedure is formulated and is shown to have desirable computational, utility-theoretic, and asymptotic properties. Several techniques are then developed which are applicable to an approximation of the efficient frontier by parametric complementary pivoting. These include a parametric algorithm for a minimax approximation, some parametric decomposition methods, and an interactive algorithm for certain problems with a block-angular structure. A listing for a Fortran 4 code solving the parametric linear complementarity problem is given in an appendix.

AD-A016 218/0GA PC$9.50/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Applications of Interval Arithmetic in Signomial Programming.
Technical rept.,
Louis J. Mancini. Aug 75, 232p Rept no. SOL-75-23
Contracts N00014-75-C-0865, N00014-75-C-0267

Descriptors: *Nonlinear programming, Optimization, Algorithms, Inequalities, Theorems.
Identifiers: *Signomial programming, *Interval arithmetic, Duality theory, Geometric programming.

Many problems in engineering design can be found formulated as a nonlinear program where a criterion function of the design variables is minimized, or maximized, subject to certain inequality and equality constraints which define the problem. Such a formulation allows the engineer to use optimization theory and numerical algorithms to find the best design, or global solution, among the possibly infinite number of reasible designs. However, optimization methods are guaranteed to yield the global solution only if the nonlinear program has a certain structure; and in many cases only a solution which is guaranteed to be locally optimal can be obtained. The problem of multiple local solutions in nonlinear programs is of major concern to both the engineer and operations researcher. If all the functions in the nonlinear program are sums of power functions, then the nonlinear program is a signomial program. All the methods presented here use interval arithmetic, a generalization of ordinary arithmetic in which the basic elements are closed intervals of the real line. This study brings interval arithmetic and signomial programming together.

AD-A016 233/9GA PC$5.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
Markov Decision Problems with Expected Utility Criteria.
Technical rept.,
David M. Kreps. 1 Jun 75, 105p Rept no. TR-29
Contracts N00014-75-C-0493, N00014-75-0521
Sponsored in part by Grants NSF-MPS74-23693 and NSF-ENG74-12378.

Descriptors: *Decision theory, *Markov processes, Dynamic programming, Decision making, Probability density functions, Mathematical models, Theorems, Theses.
Identifiers: *Markov decision processes, *Utility functions.

Finite state and action Markov decision problems with expected utility criteria are analyzed. A Markov decision chain (or sequential decision process) is defined in the usual manner. But instead of seeking to maximize the expected sum (or product) of rewards, the objective is maximization of the expectation of some cardinal utility function defined on the sequence of rewards.

AD-A016 235/4GA PC$5.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
Markov Decision Problems with Expected Utility Criteria.
Technical rept.,
David M. Kreps. 1 Jun 75, 105p Rept no. TR-36
Contracts N0014-75-C-0521, N00014-75-C-0493
Sponsored in part by Grants NSF-MPS74-23693, and NSF-ENG-74-12378.

Descriptors: *Decision, theory, *Markov processes, Dynamic programming, Decision making, Probability density functions, Theorems, Theses.
Identifiers: *Markov decision processes, *Utility functions.

Finite state and action Markov decision problems with expected utility criteria are analyzed. A Markov decision chain (or sequential decision process) is defined in the usual manner. But instead of seeking to maximize the expected sum (or product) of rewards, the objective is maximization of the expectation of some cardinal utility function defined on the sequence of rewards. The standard notions and results of infinite horizon problems with additive utility are extended to the case of general utility. Appropriate optimality equations, conserving strategies, policy iteration and value iteration concepts are given. Analogues of negative, positive, convergent and transient dynamic programming are defined and the standard results proven; e.g., conserving strategies are optimal in the cases analogous to negative, convergent and transient dynamic programming. Because utility functions are not generally separable, optimal strategies must take into account more than just the current state. But generalizations of memoryless and stationary strategies are given, and conditions are established under which there exists an optimal memoryless/stationary strategy. The basic notion is summarized utility; rewards up to every decision epoch are summarized (with 'sufficient' richness) in a single number.

AD-A016 282/6GA PC$3.75/MF$2.25
University of Southern California Los Angeles Social Science Research Inst
Assessing the Reliability and Validity of Multi-Attribute Utility Procedures: An Application of the Theory of Generalizability.
Technical rept.,
J. Robert Newman. 1 Jul 75, 44p Rept nos. USC-001597-2-T, SSRI-RR-75-7
Contract N00014-75-C-0487, ARPA Order-2105

Descriptors: *Decision theory, Analysis of variance, Decision making, Sampling, Estimates.
Identifiers: Utility functions, Multiattribute utility functions.

This report presents a theoretical rationale for assessing the reliability, validity, and dependability of multi-attribute utility models and techniques. If an investigator is advocating the use of a MAU model or procedure he or she is interested in generalizing from oservations at hand to a universe or domain of observations that are members of that same universe. The universe must be unambiguously defined but it is not necessary to assume that universe as having any statistical properties such as uniform variance or covariances. A study of generalizability is conducted by taking measurements on persons, stimuli, tasks, etc. that are assumed to be randomly representative of a universe an investigator wishes to generalize to. The ratio of an estimate of the universe 'score' variance to an estimate of the observed score variance is the coefficient of generalizability. This is estimated by the intra-class correlation coefficient. ANOVA and the Expected Mean Square paradigm of Cornfield and Tukey is used to obtain the appropriate variance estimates. The theory dispenses with unnecessary and unwarranted assumptions, and eliminates the distinction between reliability and validity.

COM-75-11380/3GA PC$4.25/MF$2.25
National Bureau of Standards, Washington, D.C. Applied Mathematics Div.
The National Bureau of Standards' Linear and Quadratic Programming Subroutines.
Final rept.,
W. G. Hall, R. H. F. Jackson, and P. B. Saunders. Feb 72, 70p* NBS-10695
See also report dated Feb 75, COM-75-11381.

Descriptors: *Linear programming, *Computer programs, Simplex method, Nonlinear programming, Subroutines, Algorithms.
Identifiers: *Quadratic programming, Kuhn-Tucker theorem, FORTRAN 5 programming language, RVSMPX computer program, SIMPLX computer program.

This report documents one phase of an effort to provide users, of the facility operated by the National Bureau of Standards' Computer Services Division, with reliable, well-tested, clearly-described solution algorithms for selected frequently-arising classes of special mathematical problems. The report presents algorithms for the simplex and revised simplex methods of linear programming, as well as their adaptations to quadratic programming. Set up as subroutines, the present versions of these codes use internal storage only, with resultant limitations on the size of the problems which can be treated.

COM-75-11381/1GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Applied Mathematics Div.
Post Optimality and Parametric Analysis with the National Bureau of Standards' Linear Programming Subroutine RVSMPX.
Final rept.,
Tyrone B. Ayers. Feb 75, 48p NBSIR-75-666
See also report dated Feb 72, COM-75-11380.

Descriptors: *Linear programming, *Computer programs, Subroutines, Algorithms.
Identifiers: Parametric programming, *RVSMPX subroutine.

The present report presents subroutines which perform posttoptimality analysis and parametric programming studies on linear programming problems solved by the National Bureau of Standards' RVSMPX subroutine. (The present versions of these codes use internal storage only.)

SU-326-P18X7 PC$4.00/MF$2.25
Stanford Univ., Calif. Dept. of Operations Research.
Systems Optimization Project. Progress Report, 1 October 1973--30 July 1974.
G. B. Dantzig, R. W. Cottle, B. C. Eaves, and R. B. Wilson. 15p
Contract AT(04-3)-326

Descriptors: (*Programming, *Research programs), (*Linear programming, Research programs), (*Mathematics, Research programs), California.

For abstract, see NSA 3208

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A016 221/4GA PC$3.25/MF$2.25
Federal Aviation Administration Washington D C
Slant Visual Range/Approach Light Contact Height Measurement Technique with Data Converter and Remote Readout Panel.
26 Oct 73, 19p Rept no. FAA-ER-450-042b

Descriptors: *Lighting equipment, *Airports, Specifications, Approach lights, Slant range, Runways, Electronic equipment, Automation, Requirements, Quality assurance, Visibility, Altitude, Information systems.
Identifiers: DOT/4IZ/IC.

This Engineering Requirement (ER) specifies the work required for the development of a slant visual range/approach light contact height measurement technique utilizing currently available instrumentation (either a development (engineering) model or an in-service model). The technique and equipment supplied as a result of these efforts will permit advising a pilot approaching an airport under conditions of poor visibility at what altitude the pilot may expect contact with the approach lights and what segment of approach lights will be visible to him at a decision of height of 100 feet.

COM-75-11365/4GA PC$3.25/MF$2.25
National Bureau of Standards, Washington, D.C. Center for Building Technology.
Modification of Fluorescent Luminaires for Energy Conservation.
Technical note, 1 Mar 75-30 Apr 75,
Robert W. Beausoliel, William J. Meese, and Gary Yonemura. Oct 75, 18p NBS-TN-886

Descriptors: *Fluorescent lamps, Revisions, Capacitors, Efficiency, Energy conservation, Power factor, Illuminating, Luminaires, Buildings.

Reducing energy consumption in existing buildings by reducing the number of lamps presents technical problems when more than one fluorescent lamp operates from a single ballast. A preliminary investigation was made whereby capacitors were substituted for one fluorescent lamp in a two-lamp luminaire which operated with a single ballast. Under optimum conditions, lighting efficiency (foot-candles per watt) was nearly as high at reduced power input as it was with two lamps operating normally. No failures in lighting equipment or capacitors occurred and no fire hazards, other safety hazards or other unsatisfactory occurrences were observed. A more thorough investigation involving a number of parameters is needed to ascertain the feasibility of this modification.

COM-75-11374/6GA PC$6.25/MF$2.25
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
A Proposed Concept for Determining the Need for Air Conditioning for Buildings Based on Building Thermal Response and Human Comfort.
Final rept. Jun 71-Dec 74,
J. E. Hill, T. Kusuda, S. T. Liu, and F. J. Powell. Aug 75, 160p* NBS-BSS-71
Sponsored in part by Department of Housing and Urban Development, Washington, D.C. Library of Congress Catalog Card no. 75-619194.

Descriptors: *Air conditioning, *Residential buildings, Criteria, Thermodynamic properties, Feasibility, Human factors engineering, Comfort, Habitability, Computerized simulation, Classifications, Computation, Recommendations, Diurnal variations, Temperature measurement.
Identifiers: Thermal response, Geographic area.

Determining the need for air conditioning can be based on a wide variety of factors. To date, the only criteria that are available are those of several federal organizations and many are not really criteria, but guidelines to be used in the determination of fund allocation; in other words, provisions are made to air condition federal facilities in specific geographical locations if pertinent weather characteristics of that locality meet certain requirements. This paper presents the concept that a true criterion can be established based both on weather characteristics of the locality as well as characteristics of the building or structure under consideration. The paper gives the details of a study showing the feasibility of such a scheme, using a simulation of two proposed residences in several geographical localities.

N75-30469/1GA PC$5.25/MF$2.25
Old Dominion Univ. Research Foundation, Norfolk, Va. School of Engineering.
Experimental and Analytical Investigation of 0 G Condensation in a Mechanical Refrigeration System Application.
E. G. Keshock. May 75, 103p NASA-CR-144400, TR-75-T6
Contract NAS9-13410

Descriptors: *Heat transfer, *Pressure reduction, *Refrigerating machinery, Flow distribution, Laminar flow, Momentum theory.

For abstract, see STAR 1321

N75-30480/8GA PC$4.25/MF$2.25
Wisconsin Univ., Madison. Space Science and Engineering Center.
Honeycomb Thermal Shield Study.
Final Report.
R. M. Dombroski. 7 Feb 75, 54p NASA-CR-144671
Contract NAS5-20068

Descriptors: *Heat shielding, *Honeycomb structures, *Radiative heat transfer, Energy transfer, Finite element method, Numerical analysis, Radiation sources.

For abstract, see STAR 1321

N75-30572/2GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Measurement and Octave Spectra of Mechanical Vibration in Acceleration and Displacement and of Noise Produced by Air Conditioning Equipment Installation.
L. X. Nepomuceno. 2 Dec 74, 17p TR-7412.745
In Portuguese; English Summary.

Descriptors: *Air conditioning, *Noise measurement, *Octaves, Health, Noise pollution, Noise reduction, Vibration measurement.

For abstract, see STAR 1321

PB-245 047/6GA PC$4.25/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Energy Conservation and Environment.
Lighting and Thermal Operations. Energy Management Action Program for Commercial-Public-Industrial Buildings.
Nov 74, 59p FEA/D-74/136

Descriptors: *Energy conservation, *Commercial lighting, *Industrial lighting, *Space heating, Illuminating, Commercial buildings, Industrial buildings, Office buildings, Hospitals, Air conditioning, Data.

Desirable targets for lighting and thermal operations are discussed, including guidelines for illumination levels, efficiency in lighting, and operating cooling and heating systems. Energy savings in selected buildings in areas of illumination, thermostat setting, building occupancy, and fan operation are given.

PB-245 064/1GA PC$4.25/MF$2.25
Naval Weapons Center, China Lake, Calif.
A Program to Evaluate and Demonstrate Conservation of Fossil Fuel Energy for Single-Family Dwellings.
Jun 75, 75p FEA/D-75/529

Descriptors: *Energy conservation, *Planning, Residential buildings, Transportation, Houses, Total energy systems, Insulation, Solar energy conversion, Heat storage, Electric appliances, Service life, Stirling cycle engines, Fossil fuels.
Identifiers: Retrofit devices.

This report outlines a program which will demonstrate reduction in the United States fossil-fuel energy usage, particularly residential, shopping and commuting. Goals include combining more efficient energy use with low-energy structures to demonstrate that fuel consumption in single-family dwellings can be cut at least in half, reducing fuel consumption further, and where solar flux is adequate, replacing use of fossil fuels in the single-family home with high temperature solar energy and demonstrating a solar-powered, thermal-storage car for short trips.

PB-245 137/5GA PC$5.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Architecture.
Exploring Space Conditioning with Variable Membranes.
Rept. for 1 Jan 74-30 Apr 75,
Timothy E. Johnson, Sean Wellesley-Miller, Day Chahroudi, John Brooks, and Steve Wagner. Apr 75, 117p NSF/RA/N-75-058
Grant NSF-GI-41306

Descriptors: *Solar space heating, *Radiant cooling, *Skin(Structural member), *Construction materials, Membranes, Solar collectors, Thermophysical properties, Feasibility, Design, Optical filters, Buildings.

Recently many architects and engineers interested in reducing the energy required to heat and cool building interiors have turned to

manipulating the thermophysical properties of the building skin in order to achieve flexible control of radiant and conducted heat losses and gains. Recent developments that gave the concept of variable building skins a boost formed the basis for this project's inquiry into generalized variable membrane designs that could be applied to a variety of building types. This project is concerned with concept development and feasibility studies, and documents findings in the following areas: (1) generalized design criteria and performance specifications for variable membranes, (2) physical principles, (3) theoretical solutions as determined by morphological analysis, (4) feasible solutions based on theoretical and empirical findings, (5) test assembly design and evaluation, (6) actual structures utilizing these concepts, and (7) related projects of the MIT Solar Energy Lab.

PB-245 348/8GA PC$5.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge, Energy Lab.
Improvement of the Environmental and Economic Characteristics of Cooling Towers. The Periodic Cooling Tower-Small Scale, Full Scale, and Surface Roughening Tests.
Annual rept. 1974-75,
Pou Cheong Hon, Je-Chin Han, Paul F. Pilger, David A. Fink, and Bruce R. Andeen. 30 Jun 75, 149p MIT-EL-75-018
See also PB-239 441. Prepared in cooperation with Empire State Electric Energy Research Corp., New York. Also pub. as Massachusetts Inst. of Tech., Cambridge. Heat Transfer Lab., Rept. no. 80047-95.

Descriptors: *Cooling towers, Heat transfer, Disks(Shapes), Heat transfer coefficient, Oils, Heat exchangers, Tests, Fluid flow, Model tests, Films, Surface roughness, Convection.
Identifiers: *Periodic cooling towers.

The report describes the past year's research on the Periodic Cooling Tower. The Periodic Tower consists of rotating sheet metal discs partially immersed in hot, power plant condensor effluent. The tower can be either wet or dry, depending upon the amount of water carried into the air side on the plates' surface. An oil layer, floating on the water's surface is effective in eliminating water carryover. The advantages of the Periodic Tower lie in the low cost of the discs and the ability to operate dry. The year's work emphasized: (1) scale model flow and heat transfer tests, (2) completion of a facility for testing full sized modules, and a parametric study of the oil film thickness on the discs, and (3) construction, instrumentation, and calibration of a test apparatus to study the further enhancement of disc performance by surface roughening.

PB-245 592/1GA PC$3.75/MF$2.25
American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., New York.
Solar Energy Utilization for Heating and Cooling,
John I. Yellott, and Carl W. MacPhee. 1974, 26p* NSF-74-41
Grant NSF-GI-39247

Descriptors: *Solar space heating, *Solar air conditioning, *Reviews, Flat plate collectors, Solar water heaters, Solar air heaters, Solar energy concentrators, Heat storage, Insolation, Solar radiation, Angle of incidence, Buildings, Systems analysis.
Identifiers: Natural air conditioning.

A program of advanced research and system analysis, subsystem tests, and system proof-of-concept experiments is being carried out by the National Solar Energy Research Program in order to establish the technological base to meet heating and cooling needs of buildings in all regions of the United States. An NSF grant was awarded to the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) for a comprehensive study of currently available design data. The results of that effort, originally published as Chapter 59 of the 1974 Edition, Applications Volume, of the ASHRAE Guide and Data Book series, is reprinted here. The chapter contains the following subheadings: Qualitative and Quantitative Aspects of Solar Energy, Technology of Solar Energy Utilization, Applications of Solar Radiation Collectors, Heat Storage Systems, Cooling by Solar Energy, Cooling by Nocturnal Radiation and Evaporation, and Solar Heating and Cooling Systems.

PB-245 669/7GA PC$5.25/MF$2.25
Mitre Corp., McLean, Va.
Impact of Energy Developments on the Sheet Metal Industry,
Arnold Cohen, Mary Harlow, Augustus Johnson, and Peter Spewak. Jun 75, 116p*
Sponsored by Sheet Metal Workers' International Association, Washington, D.C.

Descriptors: *Metal industry, *Solar space heating, *Solar air conditioning, Solar collectors, Energy policy, Cost effectiveness, Marketing, Solar water heaters, Solar air heaters, Energy conservation, Heat recovery, Buildings, Reviewing, Reviews, National government, Energy demand, Planning, United States, Industries.
Identifiers: Waste heat utilization.

This report surveys the present energy situation, the federal government's energy policies and programs, and the state-of-the-art in solar heating and cooling of buildings and in energy conservation. It recommends a program of specific action for the Sheet Metal Workers International Association which will, at the same time, serve the nation's energy needs and provide employment opportunities for the Union's members.

PB-245 670/5GA PC$5.25/MF$2.25
Mitre Corp., McLean, Va.
Strategic Implications of Solar Energy for Employment of Sheet Metal Workers,
H. W. Brock, G. R. Murray, J. D. McConnell, and J. C. Snipes. Jun 75, 116p*
Sponsored by Sheet Metal Workers' International Association, Washington, D.C.

Descriptors: *Metal industry, *Solar space heating, *Solar air conditioning, Energy demand, Energy supplies, Energy consumption, Fuel consumption, Electricity, Coal, Natural gas, Nuclear energy, Shale oil, Synthetic fuels, Forecasting, Buildings, Marketing, Cost estimates, Reviews, Reviewing, Manpower, Earnings.
Identifiers: Electric power consumption.

The report reviews the present situation and the future outlook for energy in the United States; identifies and evaluates solar and other energy related technological developments; evaluates probable impacts of solar energy on sheet metal work; and identifies and recommends strategic alternatives for the sheet metal Union.

13B. Civil Engineering

AD-A015 647/1GA PC$5.25/MF$2.25
National Marine Fisheries Service Highlands N J Middle Atlantic Coastal Fisheries Center
An Environmental Survey of Effects of Dredging and Spoil Disposal, London, Connecticut.
Quarterly rept. no. 4, Apr-Jun 75.
15 Aug 75, 119p Rept no. MACFC-Informal-75
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. Prepared in cooperation with Connecticut Univ., Noank. Marine Research Lab., and New York Ocean Science Lab., Montauk. See also report dated 5 May 75, AD-A014 596.

Descriptors: *Oceanographic data, *Solid wastes, *Waste disposal, *Environmental protection, Civil engineering, Ocean currents, Measurement, Salinity, Turbidity, Bacteria, Water pollution, Monitoring, Water quality, Connecticut.
Identifiers: *Dredging, *Dredge spoil, Thames River, *Ocean dumping, New London(Connecticut).

The report considers the activities and findings of the several integrated research projects designed to monitor the environmental effects of dredging in the Thames River and dredge spoil disposal at the New London Dumping Ground. Surveying of dredging impacts on suspeded materials in the Thames River has been completed by UCONN. The data confirm earlier indications that effects are limited to within 150 m of the dredge. A model of the river's flow characteristics has been selected and is in the the testing phase. (Three predredging surveys were conducted to determine baseline temperature, salinity, suspended solids and light transmission characteristics of the lower Thames River. These data were also used, in conjunction with historical information, to estimate predredging circulation of the lower river.) Mercury in river water was lower in February and April 1975 than during earlier periods, perhaps due to the removal by dredging of contaminated sediments. The report indicates large decreases, apparently due to natural seasonality, in benthic macrofaunal densities throughout the study area between predisposal and April 1975 collections. Predisposal water and sediment samples from 44 stations have been analyzed for fecal coliform and other bacteria. Highest fecal coliform counts were found in the river. Coliform counts were higher at disposal area stations on an ebb than on a flood tide, indicating that the Thames River outflow can have an effect on water quality within the designated disposal area.

AD-A015 882/4GA PC$3.75/MF$2.25
Coast Guard Research and Development Center Groton Conn
Monitoring Dissolved Hydrocarbons as a Function of the Tidal Cycle (New York Harbor).
Final rept.,
William E. McGowan. Apr 75, 39p Rept no. CGR/DC-4/75 USCG-D-106-75

Descriptors: *Water pollution, *Hydrocarbons, *Monitoring, Chemical oceanography, Gas chromatography, Ocean tides, Diurnal variations, Dissolving, Pollutants, Monitors, Bays, Sea water, Concentration(Chemistry), Oil pollution, Harbors, New York, Sampling, Field tests, Test methods, Test equipment, Acceptability, Accuracy.
Identifiers: Dissolved gases, DOT/5C, DOT/BZ/BL.

Measurements of dissolved hydrocarbon (C1-C4) as a function of the tidal cycle are reported. Measurements were made from 19 Sep to 5 Oct 1973 to evaluate a dissolved hydrocarbon monitoring system and to gain information about the behavior of dissolved pollutants in a tidal cycle. Sea water was pumped from 2-3 feet below the water level of New York Harbor and sprayed into a partially evacuated chamber where hydrocarbons were released as gases and subsequently transferred to a portable gas chromatograph for analysis. Generally, the monitoring system operated properly in the field with an experimental error of less than 20%. The trends of the relative data illustrate both the change in hydrocarbon concentration over the tidal cycle (as much as 6X) and the day-to-day variation of the coordinated tidal data. These data indicate that efficient and meaningful

monitoring of dissolved pollutants can be accomplished best with an understanding of the tidal pattern of the pre-existing pollutants. Such background information is essential: (1) to determine a sampling window in the tidal cycle which will appropriately reflect the pollutant input relative to the pre-existing levels; (2) to interpret the extent and time frame of the increase due to the pollution incident; and (3) to interpret possible irregularities in the surveillance data obtained during the sampling window.

AD-A015 883/2GA PC$7.25/MF$2.25
Exxon Research and Engineering Co Linden N J Government Research Lab
Identification of Weathered Oil Films Found in the Marine Environment.
Final rept. 15 Jun 73-15 May 74,
John W. Frankenfeld, and Wolfgang Schulz.
Jun 74, 206p Rept no. GRUS.2PA.74 USCG-D-107-75, CGR/DC-36/74
Contract DOT-CG-23035-A

Descriptors: *Oil spills, Chemical analysis, Weathering, Simulation, Pollutants, Petroleum products, Water pollution, Oil pollution, Hydrocarbons, Classification, Identification, Residual, Distillates, Lubricants, Thin layer chromatography, Infrared spectrometers, Gas chromatography, Distillation, Boiling point, Specific gravity, Ratios, Sampling.
Identifiers: Liquid chromatography, Crude oil, DOT/5C, DOT/BZ/BL.

A study was undertaken to develop a rapid, efficient method for identifying the source of spilled oil. Fifty-seven different petroleum products were weathered under controlled conditions in laboratory simulators. Samples were taken periodically and examined by a variety of analytical techniques. The analytical methods were graded on their abilities to (1) classify petroleum products as to generic type and (2) identify the actual source of the spilled oil. Four types of analyses were identified as being especially useful: thin-layer chromatography, infrared fingerprinting, gas chromatographic fingerprinting and liquid-liquid chromatography. The application of these techniques is discussed in detail and examples are given. By use of a combination of these four techniques all oils studied in this project could be uniquely identified. (Author)

AD-A015 964/0GA PC$4.25/MF$2.25
Naval Surface Weapons Center White Oak Lab Silver Spring Md
A Chemical Monitoring Program of the Explosion Products in Underwater Explosion Tests.
Technical rept.,
Ming G. Lai. 4 Apr 75, 64p Rept no. NSWC/WOL-TR-75-35

Descriptors: *Monitors, *Water quality, *Underwater explosions, *Water pollution, *Water chemistry, Sampling, Solids, Sedimentation, Gases, Chemical composition, Fresh water, Sea water, Solutions(Mixtures), Filtration, Chemical analysis, Gas chromatography, Collecting methods.
Identifiers: *Water quality.

A chemical monitoring program of the explosion products in underwater explosion tests is described. The objective of the program is to monitor water quality chemically after underwater explosion tests. The program consists of sampling and preservation of water and sediment samples, separation, concentration, and determination of various explosion products. General concepts, procedures, and equipment needed for each phase of the program are presented. Guidelines and recommendations for the overall program are also given. (Author)

AD-A01[illegible]47/3GA PC$5.25/MF$2.25
Cadcom inc Annapolis Md
Application of U. S. Navy Pollution Abatement Technology to Local Governments and Industries.
Final rept. Oct 74-Mar 75,
Rhodes R. Copithorn, Don L. Griffin, and C. O. Heller. Mar 75, 110p Rept no. CADCOM-75-3
Contract N00014-74-C-0058

Descriptors: *Naval planning, Technology, Water pollution, Assessment, Comparison, Civil affairs, Urban areas, Industrial relations, Boats, Workshops(Meetings), Transfer.
Identifiers: *Water pollution abatement, Boating, *Technology transfer.

Water pollution abatement technology within the U.S. Navy was evaluated and compared with the needs of the civilian sector, particularly municipalities, industries, and the boating community. Since the Navy technology appeared to have potential application within the civilian sector, recommednations were made as to methods for improving the transfer of the technology. One potential transfer vehicle that was utilized was a one-day workshop entitled 'Workshop on the Application of Pollution Abatement Technology to Local Governments,' held in Annapolis on October 16, 1974. The workshop was sponsored by the Naval Ship Research and Development Center.

AD-A016 051/5GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Dredged Materials Research: Notes, News, Reviews, etc.
Sep 75, 8p Rept no. AEWES-Misc-Paper-D-75-9
See also report dated Mar 75, AD-A007 536.

Descriptors: *Soils, *Waste disposal, *Land use, Scientific research, Swamps, Marine biology, Earth fills, Ecology, Environments.
Identifiers: *Dredging, *Dredge spoil, *Salt marshes, Land reclamation, Environmental impacts, James River.

Contents:
- Progress report, James River marsh development study;
- Containment area operations;
- Marsh development;
- Dredged material densification;
- Disposal area reuse;
- Treatment of contaminated dredged material;
- Research study for the development of dredged material disposal criteria.

AD-A016 118/2GA PC$4.75/MF$2.25
Office of the Chief of Engineers (Army) Washington D C
An Evaluation of Land Treatment of Municipal Wastewater and Physical Siting of Facility Installations.
Final rept.,
Willis J. Hartman, Jr. 16 May 75, 80p

Descriptors: *Waste water, *Sewage disposal, Irrigation systems, Soils, Waste disposal, Waste water, Land use, Site selection, Vegetation, Management planning and control, Public health.
Identifiers: *Sewage irrigation, *Land disposal, Waste water reuse.

The main purpose of this study is to familiarize policy and decision makers with the land treatment method of treating or 'disposing' municipal wastewater. An attempt is made to provide preliminary guidance to designers for how and where the facility can be sited in relation to the population served. The environment created was evaluated with emphasis on that environment which impacts on people living nearby. Evaluations were made of characteristics of potential areas and areas currently served, size of population served, soils, crops, health hazards, aesthetics and rate and quantity of application. Factors which affect siting are set out for the consideration of the facility designer. Four siting techniques (planning goals) were established; buffer area, isolation, natural resource preserve and farm-municipality cooperative. Land treatment is certainly a most worthy method of treating municipal wastewater from large as well as small populations where the soil and climatic conditions are favorable, and the farmers economic situation can be improved.

AD-A016 147/1GA PC$3.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Protection of Slopes Against Rainfall Erosion.
Final rept. Jul 74-Jun 75,
Edward B. Perry. Sep 75, 41p

Descriptors: *Soil erosion, *Rainfall, *Slopes, Construction, Soil mechanics, Simulators, Soil stabilization, Runoff, Test methods, Protection, Effectiveness, Sprays.
Identifiers: Slope stability.

Commercially available spray-on stabilizers are represented as being capable of controlling soil erosion between the time of slope construction and establishment of a vegetative cover. This study presents a review of previous research on rainfall erosion process, mechanics of rainfall erosion, characteristics of natural rainfall, rainfall simulators, studies of rainfall erosion of soils and studies of rainfall erosion of laboratory rainfall simulator.

AD-A016 148/9GA PC$4.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Design of Entrance Channel Improvements for Ludington Harbor, Michigan; Hydraulic Model Investigation.
Final rept.,
Leroy G. Crosby, and Claude E. Chatham, Jr. Sep 75, 77p Rept no. AEWES-TR-H-75-14

Descriptors: *Harbors, *Breakwaters, *Hydraulic models, Harbor models, Lake waves, Channels(Waterways), Michigan.
Identifiers: Ludington Harbor, *Check structures.

A 1:100-scale model of Ludington Harbor, Michigan, including about two-thirds of Pere Marquette Lake and sufficient offshore area of Lake Michigan to permit generation of the required test waves, was used to investigate the effects of a proposed harbor entrance improvement plan on wave action in the harbor. The basic improvement plan consisted of removing 100 ft from the outer end of the south breakwater, deepening the entrance to 29 ft over a width of 600 ft, removing the existing south jetty, and widening the inner entrance channel to 230 ft at a depth of 27 ft. Modifications to the basic plan which were tested consisted of several wave absorber designs along the inner entrance channel and raising the crown elevation of the north and south breakwaters to prevent wave overtopping. A 50-ft-long wave generator and a computer-controlled electrical wave height measuring and recording system were used in model operation.

AD-A016 149/7GA PC$5.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Wave and Current Conditions for Various Modifications of Kewalo Basin, Honolulu, Oahu, Hawaii, Hydraulic Model Investigation.
Final rept.,
Michael L. Giles. Sep 75, 133p Rept no. AEWES-TR-H-75-15

Descriptors: *Harbors, *Hydraulic models, Basins(Geographic), Ocean waves, Breakwaters, Hawaii, Ocean currents.

Identifiers: Oahu Island, Kewalo Basin, *Check structures.

A 1:75-scale undistorted hydraulic model of Kewalo Basin, Oahu, Hawaii, and sufficient offshore area to permit generation of the required test waves was used to develop and test several plans of improvement proposed to eliminate: (a) crosscurrents in the entrance channel, (b) the presence of peaking and breaking waves in the entrance channel, and (c) undesirable wave action in the basin. Improvement plans consisted of (a) a proposed wave absorber along the channel sides, (b) various jetty plans, (c) removal of the channel shoal, and (d) various combinations of the above. A 50-ft-long wave machine and an electrical wave height measuring and recording apparatus were used in the model. Tests were conducted with existing conditions installed and the results were compared with those for various improvement plans.

AD-A016 155/4GA PC$11.25/MF$2.25
Minnesota Univ Minneapolis Dept of Civil and Mining Engineering
Rational Design of Tunnel Supports: Tunnel Support Loading Caused by Rock Failure.
Final rept.,
Jaak Joseph K. Daemen. May 75, 440p MRD-TR-3-75
Contract DACW45-74-C-0066

Descriptors: *Tunnels, *Supports, Rock, Failure(Mechanics), Loads(Forces), Rock mechanics, Finite element analysis, Computer programs, Theses.
Identifiers: *Tunnels supports.

Two methods are presented for the analysis of tunnel support loading caused by rock failure. In the first part of this thesis closed-form solutions are used, in the second part numerical techniques. Emphasis is put upon the statical indeterminacy of the problem and upon the necessity for considering the relative displacements between ground and support. From this follows the need for a realistic calculation of the stiffness of ground and support, as well as the need to consider the sequential development of the interaction between these two elements. It is assumed that the rock mass behavior during failure is softening and dilatant. Interface problems between ground and support that can strongly influence the effective support stiffness are discussed. In the second part of this thesis the ground behavior is modeled by the finite element method. The elastic parameters that determine the rock behavior are changed progressively in order to simulate softening and volume increase of the failing rock mass. This method is used in an axisymmetric analysis of failure patterns near the face and to study the influence of face behavior on support loading.

COM-75-11390/2GA PC$4.75/MF$2.25
National Oceanic and Atmospheric Administration, Boulder, Colo. Marine Ecosystems Analysis Program Office.
Ocean Dumping in the New York Bight.
Technical rept.,
Charles G. Gunnerson, and R. L. Swanson. Mar 75, 83p NOAA-TR-ERL-321, MESA-2 NOAA-75091802

Descriptors: *Sewage disposal, *New York Bight, *Spoil, Circulation, Industrial wastes, Water flow, Organic acids, Chemical properties, Benthos, Concentration(Composition), Soils, Sludge, Fishes, Bacteria, Ocean environments, Marine biology, Water quality, Marine geology.
Identifiers: *Ocean dumping, Dredge spoil, *Water quality data, Path of pollutants.

The New York Bight extends seaward over 15,000 square miles from Long Island and New Jersey to the edge of the continental shelf, some 80-100 nautical miles off-shore. Wastes from 20 million people are discharged to the Bight. These wastes arrive by a variety of routes: ocean dumping, outfall sewers, air pollution, river discharge, land runoff, thermal discharges, vessel wastes, and occasional spills. Although impacts of these wastes on the marine environment are not clearly understood, there is evidence that the waters, bottom sediments, and living resources are under stress. An average of 260 million cu ft 7,400,000 cu m per year of dredge spoils were dumped each year between 1965 and 1970, as well as waste acid, and construction and demolition debris. The hazards of this dumping are not known, however above normal incidence of fin-rot disease in fish in the area and the closing of the area to shellfishing are indications that something is wrong.

COM-75-11393/6GA PC$4.25/MF$2.25
Rhode Island Univ., Kingston. Dept. of Mechanical Engineering and Applied Mechanics.
Modeling an Ocean Pond. A Two-Dimensional, Finite Element Hydrodynamic Model of Ninigret Pond, Charlestown, Rhode Island.
Technical rept.,
Hsin-Pang Wang. 1975, 66p* Marine TR-40 NOAA-75091808
Grant NOAA-04-3-158-3

Descriptors: *Estuaries, *Tidal currents, *Hydrodynamics, *Ninigret Pond, *Environmental surveys, Nuclear power plants, Limnology, Mathematical models, Numerical integration, Water quality, Sites, Boundary layer flow, Finite difference theory, Temperature, Water flow, Computer programs, Rhode Island.
Identifiers: Sea Grant program, Finite element analysis, *Charlestown Pond.

The proposed site for a nuclear electric power station is on the north shore of Ninigret Pond in Rhode Island. The determination of the hydrodynamic characteristics of the salt pond is the preliminary step for subsequent investigations of parameters such as water quality, temperature, and sedimentation. Tidal motion in a shallow estuary has been modeled mathematically by vertically integrated, two-dimensional, hydrodynamic equations which present the approach to modeling in this work. But due to the complexity of this system of nonlinear partial differential equations and the existence of irregular geometric boundary conditions in the pond, an analytical solution is not feasible. Instead, two numerical techniques, the finite difference and the finite element, usually are applied to real estuaries. This study used the Galerkin weighted-residual method through which the finite-element scheme can be implemented without a knowledge of the particular variational principle of the governing equation. The objectives of this report are: (1) To investigate the efficiency of different numerical integration schemes; and (2) to develop a suitable finite-element algorithm to simulate the tidal currents in Ninigret Pond.

NTIS/PS-75/760/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Air Pollution Effects on Materials (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Edward J. Lehmann. Oct 75, 87p*
Supersedes NTIS/PS-74/113.

Descriptors: *Bibliographies, *Atmospheric corrosion, Air pollution, Corrosion, Steels, Textiles, Construction materials, Particles, Sulfur dioxide.
Identifiers: *Air pollution effects(Materials).

This bibliography contains selected of Government-funded research reports on corrosion and damage by air pollution. This includes studies on the effects upon steel, textiles, and building materials. Many studies cover a specific pollutant and its corrosive or damaging properties. (Contains 82 abstracts).

NTIS/PS-75/772/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Beryllium Pollution (A Bibliography with Abstracts).
Rept. for 1964-Oct 75,
Kirk G. Werner, and Robena J. Brown. Oct 75, 85p*
Supersedes NTIS/PS-75/021.

Descriptors: *Beryllium, *Bibliographies, *Air pollution, *Water pollution, Toxicity, Solid waste disposal, Chemical analysis, Air pollution control, Water pollution control, Flue gases, Particles, Water analysis, Air quality, Water quality.

The bibliography covers research on air and water pollution by beryllium. This includes sources; control; detection and analysis; toxic effects on plants, animals, humans; and air and water quality emissions. Environmental levels of radioactive and radiation-produced beryllium are excluded. (Contains 80 abstracts)

N75-30635/7GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Remote Sensing Study of Maumee River Effects of Lake Erie.
R. Svehla, C. Raquet, D. Shook, J. Salzman, and T. Coney. Jul 75, 28p NASA-TM-X-71780, E-8439

Descriptors: *Lake Erie, *Remote sensors, *Water quality, Contaminants, Earth resources, Particulate sampling, Streams.

For abstract, see STAR 1321

N75-30637/3GA PC$4.25/MF$2.25
Alabama Univ., Huntsville. School of Graduate Studies and Research.
Earth Resources Data Acquisition Sensor Study.
Final Technical Report, 1 Dec. 1974 - 31 May 1975.
E. W. Grohse. Jul 75, 73p NASA-CR-143925
Contract NAS8-31169

Descriptors: *Data acquisition, *Earth resources program, *Pollution monitoring, *Remote sensors, *Water pollution, Data processing, Earth resources, Pollution control, Resources management, Technology utilization, Water quality.

For abstract, see STAR 1321

ORO-4254-30 PC$4.25/MF$2.25
Oklahoma State Univ., Stillwater.
Mineral Cycling in Reservoirs.
D. W. Toetz. 1974, 21p CONF-741167-1

Descriptors: (*Nitrogen, *Kinetics), (*Water reservoirs, *Chemical composition), (*Nitrogen compounds, *Distribution), Animals, Atmospheric precipitations, Gases, Ground water, Minerals, Nitrogen fixation, Plants, Reviews.

For abstract, see NSA 32 08, number 19688.

PAT-APPL-452 082/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Cargo/Ballast Separation by Dual Membrane System.
Patent Application,
F. S. Hering, and J. I. Schwartz. Filed 18 Mar 74, 12p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ballast tanks, *Membranes, Oil pollution, Water pollution, Separation, Patents.
Identifiers: *Patent applications, PAT-CL-114-74-R, *Oil water separators, *Oil pollution control, Ballast water.

The patent application concerns a ballasting system for oil tankers and other ships for separating the oil and the water ballast which eliminates oil contamination and pollution in ballasting and deballasting ships. Flexible fabric-reinforced or stretchable membranes are attached in liquid sealing relationship within the oil tank all around at the athwartships quarter-points to thereby preclude flow between the oil and ballast water. Ballast water is contained in the tank on one side of the membranes while the oil cargo or the flowable cargo is separated on the other side of the membranes. The entire tank can be maintained full for ship stability and prevention of sloshing of the fluids.

PB-231 300-18/GA PC$25.00/MF$25.00
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Wastewater Treatment Construction Grants Data Base; Public Law 92-500 Project Records New Projects Funded During September 1975.
21 Oct 75, 145p* EPA/GAD/2-75-010
Paper copy available on subscription $100.00/year domestic, $125.00/year foreign.

Descriptors: *Sewage treatment, *Industrial waste treatment, *Water pollution control, *Grants, Industrial plants, Construction.
Identifiers: *Sewage treatment plants.

Awards for wastewater treatment facilities under Public Law 92-500 are listed on a monthly basis. This publication provides the essential information on all awards made during the month listed. The awards are sorted by state and the information provided is applicant identification, grant number, grant title, award date, award amount, grant step such as one-planning, two-design, three-construction, description of facility to be constructed and other data.

PB-244 773/8GA PC$15.25/MF$2.25
Oceanographic Inst. of Washington, Seattle.
Risk Analysis of the Oil Transportation System.
Final rept.
8 Sep 72, 678p OIW-OCW-7201
Report to the Legislature (43rd), State of Washington, Olympia, 8 September 1972.

Descriptors: *Risk, *Oils, *Water pollution, *Petroleum transportation, Accidents, Marine transportation, Forecasting, Systems analysis, Mathematical models, Reliability, Regulations, State government, National government, Oceans, Tanker ships, Washington(State).
Identifiers: *Oil pollution, Fault tree analysis, *Transportation safety.

This report develops a framework for a risk analysis of the oil transportation system in Washington State which integrates statistics and probability, combinatorial logic, systems engineering, physical and behavorial sciences, reliability, maintainability, and system safety analyses. Three phases are described: risk identification and definition, including gross hazards analysis (GHA) and failure modes and effects analysis (FMEA); risk evaluation using mathematical modeling and fault tree analysis; and risk reduction, discussing alternative selection, decision making, and methods for taking action. Included are recommendations to the State Legislature and a comprehensive bibliography.

PB-244 933/8GA PC$4.25/MF$2.25
Viladas (Joseph M.) Co., Greenwich, Conn.
Impact of the Fuel Shortage on Public Attitudes Toward Environmental Protection. Volume 1. A Follow-up Survey of National Opinion About Environmental Problems and Their Solution.
Jun 75, 57p

Descriptors: *Fuel shortages, *Public opinion, Pollution, Environmental surveys, Attitudes.
Identifiers: Environmental quality.

The study deals with people's attitudes about relaxing environmental protection as a means of helping the U.S. cope with the fuel shortage. The data were gathered in May 1974.

PB-245 082/3GA PC$5.25/MF$2.25
Development Planning and Research Association, Inc., Manhattan, Kans.
Economic Impact Analysis of Effluent Guidelines: Animal Feed, Breakfast Cereal and Wheat Starch Segments of the Grain Mills Industry.
Final rept.,
Samuel G. Unger, Robert J. Buzenberg, and Alan H. Ringleb. Aug 75, 110p* EPA/230/2-75/038
Contract EPA-68-01-1533

Descriptors: *Food processing, *Water pollution control, *Economic impact, Grains(Foods), Standards, Cost estimates, Water pollution abatement, Financing, Pricing, Competition, Technology, Profits, Employment, Industrial plants, Shutdowns, Cereal products, Social effect.
Identifiers: *Water pollution economics, *Grain processing industry, Grain milling, SIC 2042, SIC 2043, SIC 2046, Water pollution standards, Industrial shutdowns, Wheat starch processing, Cereal breakfast food.

The economic impacts of proposed effluent limitations guidelines on three segments of the grain milling industry were assessed: animal feed (SIC 2042) breakfast cereal (2043) and wheat starch-gluten (2046) processing. The analysis included classification and description of types of firms and plants, evaluation of pricing mechanisms and relationships and financial profiles of selected model plants. Financial impacts of proposed effluent treatment technology were assessed in terms of price, industry returns, and production volume. Employment, community impact and international trade effects were also assessed. Limits of the analysis were stated. Overall, the proposed controls of this study (point source category only) will neither directly nor seriously impact the three segments studied in the short run. Water effluent problems of the animal feed segment are inconsequential and detailed assessments were not required. Virtually all breakfast cereal and wheat starch processing plants are connected to municipal treatment systems and this minimizes applicability of the proposed guidelines. The breakfast cereal industry is sufficiently viable to withstand proposed costs for pollution control facilities if required. However, the potential impacts of the guidelines on the wheat starch segment are such that new entrants into the industry would not be expected if private treatment systems were required.

PB-245 125/0GA PC$3.75/MF$2.25
Engineering Science, Inc., Oakland, Calif. Research and Development Lab.
Process Alternatives for Removal of Carbonaceous, Nitrogenous, and Phosphorus Materials from Concentrated Waste Streams.
Water pollution control research series.
Nov 70, 30p FWQA-17010-EVB-11/70
Contract DI-14-12-431

Descriptors: *Sewage treatment, *Industrial waste treatment, *Water pollution control, Carbon, Nitrogen, Phosphorus, Feasibility, Removal, Process variables, Comparison, Cost analysis, Chemical removal(Sewage treatment), Process charting, Anaerobic processes.
Identifiers: Computer aided analysis, Ammonia stripping, Denitrification.

An approach is described for assessing the economic feasibility of treating concentrated waste streams for removal of carbon, nitrogen, and phosphorus (CNP) constituents. Candidate process train alternatives (using conventional wastewater treatment processes) were formulated on the basis of laboratory evaluations to assess the feasibility of these processes for separation and/or conversion of CNP constituent from concentrated waste streams. A treatment system simulation model is described which is capable of tracking material (CNP) flows through the candidate process trains, predicting the removal of CNP materials in each process on the basis of relationships formulated from the laboratory studies, computing costs for each feasible process train in the candidate trains for the specific input concentrated waste stream flow rate and quality, and selecting the least cost alternative for treatment of the stream to specified quality levels.

PB-245 127/6GA PC$7.25/MF$2.25
Battelle Columbus Labs., Ohio.
Development of Predictions of Future Pollution Problems.
Socioeconomic environmental studies series,
James E. Flinn, and Robert S. Reimers. Mar 74, 219p* EPA/600/5-74-005
Contract EPA-68-01-1837

Descriptors: *Air pollution, *Water pollution, *Forecasting, *Solid waste disposal, Abatement, Predictions, Contaminants, Waste disposal, Exhaust gases, Trace elements, Hazardous materials, Particles, Industrial wastes, Agricultural wastes, Sewage disposal, Radioactive wastes, Land use, Government policies, Project planning, Assessments.
Identifiers: *Research needs.

The report describes the results of a program to identify, rank and project short- and intermediate-term future pollution problems. Identification was accomplished using three independent search approaches based on industrial production, environmental, and societal trends and activity. Primary emphasis was placed on the environmental trends as gleaned from EPA, Battelle, Literature, and other sources. An initial list of problems was compiled with specific stressors identified with each. Nine ranking factors were devised to select ten 'most serious' problems from the initial list. The factors included: persistence; mobility/pervasiveness; environmental, technological, social, and political complexity; physiological risk; research needs; and bulk or volume of the pollutant. The ten problems selected by this method were further ranked in order of relative importance. The ten selected problems in rank order are as follows: (1) Impacts of new energy initiatives; (2) Geophysical modifications of the earth; (3) Trace element (metal) contaminants; (4) Proliferating hazardous and toxic chemicals; (5) Emissions from new automobile fuels, additives, and control devices; (6) Disposal of waste sludges, liquids, and solid residues; (7) Critical radiation problems; (8) Fine particulates; (9) Expanding drinking water contamination; (10) Irrigation (impoundment) practices. Five to ten year projections were made of the ten problems which resulted.

PB-245 132/6GA PC$9.25/MF$2.25
Bechtel, Inc., Gaithersburg, Md.
Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 4. Scenario Development and System Simulation.
Final rept.,

C. W. Gillespie, R. A. Arnlund, M. McGinnis, A. Buchan, and E. Clausing. Jun 75, 324p
FRA/ONECD-75/4
Contract DOT-FR-40027
See also PB-243 419.

Descriptors: *Rapid transit railways, *Passenger transportation, *Northeast Region(United States), Planning, Services, Estimates, Railroads, Rail transportation, Operations research, Routes, Railroad tracks, Systems engineering, Systems analysis, Simulators, Railroad signals, Mathematical models.
Identifiers: Travel demand, Commuter rail systems, Railroad-highway crossings, LOGSIM computer program, DOT/2C, DOT/1B.

The report covers, in brief, the preliminary work performed in identification, development, and evaluation of 14 alternative scenarios to handle estimated high potential demand for rail services in the Northeast Corridor in 1990. Additionally, the report outlines the approach and methodology, the assumptions and constraints, and the findings resulting from the LOGSIM simulation of Scenario 13, at the estimated high potential demand for 1990. Changes in track configuration and interline connections for 1990 operations are identified.

PB-245 160/7GA PC$5.25/MF$2.25
Anchorage, Alaska.
City of Anchorage Demonstration Transportation Grant.
Jul 74, 101p UMTA-AK-06-0001-74-1
Grant DOT-UT-783

Descriptors: *Mass transportation, *Urban transportation, Buses(Vehicles), Planning, Mobility, Central city, Routes, Scheduling, Alaska.
Identifiers: Anchorage(Alaska), Elderly persons, Physically handicapped persons, American Indians, DOT/1A, DOT/3B, Disadvantaged minorities.

The objective of the demonstration project was to develop a fixed route transportation system in an area of limited mass transportation services, the city of Anchorage, Alaska. Groups served by this project include the elderly, handicapped, Indians, Native Eskimos, poor, unemployed, and youth. Several concepts of the demonstration were: (1) Inner-city circulation which would enable transit users to travel between different areas of the city. These routes provided resident access to health, employment, business and social service facilities. (2) Home-to-work and work-to-home services within the area served by the project. The effectiveness and benefits of the operation were measured and evaluated. Elements of the demonstration included: A take-home passenger survey to determine passenger attitudes, trip origins and destinations; a monthly bus pass, at reduced fares; and a shuttle service from a parking lot to the downtown core area.

PB-245 163/1GA PC$7.00/MF$2.25
Southwest Research Inst., San Antonio, Tex.
Methodology for Determining Fuel Effects on Diesel Particulate Emissions.
Final rept. Jun 73-Feb 75,
Charles T. Hare. Mar 75, 193p EPA/650/2-75/056
Contract EPA-68-02-1230

Descriptors: *Exhaust gases, *Air pollution, Diesel fuels, *Particles, Exhaust emissions, Gas sampling, Chemical analysis, Sulfur, Carbon, Hydrogen, Nitrogen, Phenols, Amines, Nitroso compounds, Monitors, Trace elements, Organic matter, Gravimetric analysis, Diesel engines, Computer programs.
Identifiers: Air pollution sampling, Particulates, *Diesel engine exhaust.

To develop a methodology for characterizing particulate emissions from diesel engines, one 2-stroke cycle engine and one 4-stroke cycle engine were operated in both individual steady-state modes and according to a variation of the 13-mode diesel emissions measurement procedure. Both engines were operated on three fuel types, each of which was used with one of two available diesel fuel additives as well as by itself. The primary particulate sampling technique employed was a dilution tunnel; and secondary evaluation techniques included a diluter-sampler developed under contract to EPA by another organization, a light extinction smokemeter, and a filter-type sampling smokemeter. Gaseous emissions were also measured, providing a running check on engine condition. Particulate mass rates were calculated from gravimetric data; and analysis of particulate included determination of sulfur, carbon, hydrogen, nitrogen, phenols, nitrosamines, trace metals, and organic solubles.

PB-245 176/3GA PC$13.25/MF$2.25
Robert S. Kerr Environmental Research Lab., Ada, Okla.
Wastewater Use in the Production of Food and Fiber--Proceedings.
Environmental protection technology series.
Jun 74, 590p EPA/660/2-74-041
Proceedings of the Conference held at Oklahoma City, Oklahoma on March 5-7, 1974.

Descriptors: *Waste water, *Water consumption, *Aquaculture, *Irrigation, *Meetings, *Agriculture, Sewage treatment, Farm crops, Production, Forage grasses, Salmon, Catfishes, Fiber crops, Public health, Disease vectors, Shellfish, Metals, Risk, Toxicity.
Identifiers: *Waste water reuse, Water utilization, Heavy metals, Sewage irrigation, Public health.

An interdisciplinary group of about 200 persons met to review the present base of scientific knowledge relating to benefits and constraints of using wastewaters for production of food and fiber. There were 27 papers presented by representatives from the fields of public health, engineering, agriculture, aquaculture, and other related scientific disciplines. Papers in two sections on potential restraints cover topics such as historical instances of disease transmission, possible transport of microbial pathogens through the food chain, legal implications, and sociological reactions. The aquaculture section deals primarily with experimental studies including such diverse approaches as culture of daphnia, salmon smolts, and water hyacinth. The agriculture section emphasizes the use of wastewater for crop production and the papers presented include case histories for long-term operating systems, as well as data from experimental studies. In addition to those papers presented at the conference, nine others have been included to make a total of 36 papers in the conference proceedings.

PB-245 177/1GA PC$12.50/MF$2.25
American Society of Planning Officials, Chicago, Ill.
Performance Controls for Sensitive Lands: A Practical Guide for Local Administrators.
Final rept.,
Charles Thurow, William Toner, and Duncan Erley. Mar 75, 542p* EPA/600/5-75-005
Grant EPA-R-802443

Descriptors: *Land use, *Natural resources, *Local government, Ordinances, Land use zoning, Streams, Water resources, Forest land, Ecology, Swamps, Management, Aquifers, Ground water, Project planning, Standards, Flood plains, Pollution, Coasts.
Identifiers: *Environmental protection, *Technical assistance, *Coastal zone management.

The report is to be used as a handbook by local planning officials in planning for and regulating the use of five distinct natural areas: streams and creeks, wetlands, woodlands, hillsides, and groundwater and aquifer recharge areas. Each section is devoted to the discussion of local regulation of land use in areas identified as 'sensitive'; and each area is discussed in terms of its ecology and value to the public, current regulatory practices, and recommended programs for regulating the area. Also included are appendices showing where and how to go about getting technical assistance from existing governmental agencies and examples of local ordinances for protecting the environmentally sensitive areas. The final section is a monograph on environmental performance standards, the result of a preliminary study on the feasibility of extending the performance standard concept used in industry to regulation of the environment.

PB-245 184/7GA PC$5.75/MF$2.25
Southern Research Inst., Birmingham, Ala.
Particulate Sizing Techniques for Control Device Evaluation.
Summary rept. Jul 74-Jun 75,
W. B. Smith, K. M. Cushing, C. E. Lacey, and J. D. McCain. Aug 75, 135p SORI-EAS-75-369
EPA/650/2-74/102-a
Contract EPA-68-02-0273
See also PB-240 670.

Descriptors: *Air pollution control equipment, *Particle size distribution, *Flue gases, *Size separation, Performance evaluation, Air filters, Cyclone separators, Impactors, Field tests, Glass fibers, Design, Calibrating, Sampling, Measurement, Gas flow, Tables(Data), Substrates, Sulfur dioxide, Electrostatic charge.
Identifiers: *Air pollution sampling, Particulates, Cascade impactors.

The report describes results of laboratory and field work related to inertial particulate size classifiers (impactors and cyclones). The impactor work deals largely with non-ideal behavior of impactors and problems encountered in field testing. Preparation and handling procedures for using glass fiber impaction substrates are discussed, together with problems resulting from SO2 reactions with certain types of glass fiber filter media. The results of a brief series of tests of electrostatic effects in impactor sampling are described: they indicate that these effects can be substantial under some circumstances. Design and calibration data are given for two series cyclone size devices: one designed to operate at a flowrate of 140 liters/minute (5 cfm); and the other, at 28 liters/minute (1 cfm). Each provides three size fractionation points in the 0.5 to 10 micrometer size interval. The cyclone systems permit collection of larger quantities of size fractionated particulates and are somewhat easier to use than are impactors.

PB-245 185/4GA PC$8.50/MF$2.25
California State Dept. of Health, Berkeley. Air and Industrial Hygiene Lab.
Evaluation of the Proposed Ambient Air Monitoring Equivalent and Reference Methods.
Environmental monitoring series,
J. J. Wesolowski, E. R. DeVera, Y. Tokiwa, W. Wehrmeister, and K. Smith. Apr 74, 257p
EPA/650/4-75-014
Contract EPA-68-02-0744

Descriptors: *Air pollution, *Monitoring, *Standards, Gas analysis, Chemical analysis, Regulations, Sampling, Measurement, Test facilities, Test equipment, Government policies, Gas analyzers, Oxidizers, Sulfur dioxide, Carbon monoxide, Automatic control, Site surveys, Laboratory tests, Performance evaluation, Assessments, Cost estimates.
Identifiers: *Air pollution sampling, Air pollution detection.

The report assesses the adequacy of the Environmental Protection Agency's proposed Ambient Air Monitoring Equivalent and Reference Methods, published in the Federal Register of October 12, 1973. To assess the applicability, validity and workability of the regulations and determine the costs to demonstrate equivalency, the provisions, specifications and test procedures of the regulations were evaluated in two phases using three automated methods or analyzers and two manual methods. The comments regarding the proposed regulations submitted to EPA by respondents were also reviewed.

PB-245 196/1GA PC$3.75/MF$2.25
Acurex Corp., Mountain View, Calif. Aerotherm Div.
Design, Development, and Fabrication of a Prototype High-Volume Particulate Mass Sampling Train.
Final rept. 26 Jun 73-30 Apr 74,
W. F. Lapson, and H. J. Dehne. May 74, 40p 7079
EPA/650/2-74/067
Contract EPA-68-02-1339

Descriptors: *Air pollution, *Monitors, *Particles, Continuous sampling, Flue gases, Instrumentation, Measuring instruments, Chemical analysis, Portable equipment.
Identifiers: *Air pollution sampling, Particulates.

The report gives results of a program to develop a high-volume sampling train with the following characteristics: 5-10 cfm sampling rate, modular, portable, 500 F probe/oven temperature, and conforming to Federal Register Method 5 basic requirements (standards of performance for new stationary sources). The program included a study of the overall requirements of stack sampling instrumentation, concluding with recommendations for portable, easier to use systems that are effective over a wide range of sampling rates.

PB-245 199/5GA PC$6.25/MF$2.25
American Public Works Association, Chicago, Ill.
Accomodation of Utility Plant Within the Rights of Way of Urban Streets and Highways. State of the Art.
Final rept. (Special rept.),
Kendall E. Bert, Morris M. Cohn, William D. Hurst, Richard Kuykendall, and Richard H. Sullivan. Jul 74, 169p SR-44 FHWA-RD-75-8
Contract DOT-FH-11-7850
Paper copy also available in set of 2 reports as PB-245 198-SET, PC$10.00.

Descriptors: *Highways, *Public utilities, *Municipal engineering, Facilities management, Eminent domain, Community development, Urban planning, Standards, Regulations, Local government, Traffic safety, Subsurface structures, United States, Canada.
Identifiers: Right of way(Land), DOT/4CZ/CY, DOT/4CZ/CA.

The report presents a technological background and factual practices upon which local agencies could build an effective, workable utility location program. Findings are based on in-depth, on-site interviews of 40 communities in the U.S. and Canada, a mail survey of 500 local agencies, of which 222 submitted replies, and the assistance and cooperation of representatives of all major utility associations, the American Society of Civil Engineers, and the Institute for Municipal Engineering of the American Public Works Association. It was found to be infeasible to recommend national standards for location of utilities due to the very large number of local and physical factors which influence location practices. Many examples of local standards are given. The report and the companion manual should be of valuable assistance to state and local highway agencies in cooperation with utility companies for making improvements to utility accommodation policies and practices.

PB-245 200/1GA PC$5.25/MF$2.25
American Public Works Association, Chicago, Ill.
Accomodation of Utility Plant Within the Rights of Way of Urban Streets and Highways. Manual of Improved Practice.
Final rept.,
Kendall E. Bert, Morris M. Cohn, William D. Hurst, Richard Kuykendall, and Richard H. Sullivan. Jul 74, 114p* FHWA-RD-75-9
Contract DOT-FH-11-7850
Also pub. as American Society of Civil Engineers, New York, Rept. no. ASCE Manual-14.
Paper copy also available in set of 2 reports as PB-245 198-SET, PC$10.00.

Descriptors: *Highways, *Public utilities, *Municipal engineering, Facilities management, Local government, Legislation, Pavements, Eminent domain, Regulations, Standards, Licenses, Construction, Subsurface structures, Traffic safety, Urban planning.
Identifiers: Right of way(Land), DOT/4CZ/CY, DOT/4CZ/CA.

The manual sets forth principles and practices under which utility facilities can be successfully accommodated within urban rights-of-way. These principles and practices can be characterized by five steps: (1) Enabling legislation to establish rights of local agencies to control use of the right-of-way; (2) provision of adequate staff and budget to protect the public's investment in its streets and highways; (3) establishment and implementation of adequate permit, inspection, and pavement restoration controls; (4) implementation of cooperation and coordination mechanisms and record systems among all major utilities; and (5) provision of accurate information to the field forces who excavate in the rights-of-way to allow them to work safely and protect existing utility plant. The manual and the companion report should be of valuable assistance to state and local highway agencies in cooperation with utility companies for making improvements to utility accommodation policies and practices.

PB-245 233-SET/GA PC$61.00
New England River Basins Commission, Boston, Mass.
People and the Sound.
28 Jul 75, 1757p-in 14v
Set includes PB-245 234 thru PB-245 247.

No abstract available.

PB-245 234/0GA PC$4.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. A Plan for Long Island Sound. Volume 1. Summary.
Final rept.
28 Jul 75, 81p LISS-01
Report on Long Island Sound Study.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Long Island Sound, Maps, Water resources, Project planning, Recommendations, Land use, Recreation, Fisheries, Population growth, Floods, Marine transportation, Power supplies, Mining, Soil erosion, Water pollution, Connecticut, New York.

The Plan outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The Summary (Volume I) of the final report presents highlights of the plan and a brief discussion of the rationale leading to recommendations on guiding growth, water management, improving access, fishing, electric power, marine transportation, mining, ferries and bridges, flood damage reduction, erosion and sedimentation, shoreline appearance and design, and plan implementation, as well as the environmental impact statement. Prepared by a team of federal, state, and regional officials, local citizens, and the scientific community, the plan is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound. Portions of this document are not fully legible.

PB-245 235/7GA PC$7.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. A Plan for Long Island Sound. Volume 2. Supplement.
Final rept.
Aug 75, 224p LISS-02
Report on Long Island Sound Study.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Long Island Sound, Maps, Water resources, Project planning, Management, Land use, Recreation, Fisheries, Soil erosion, Marine transportation, Power supplies, Mineral deposits, Floods, Sedimentation, Connecticut, New York.

The plan outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The Supplement (Volume 2) of the final report enumerates the major alternatives considered in formulating the recommendations, together with an explanation of how the plan was prepared, and background information organized both by subject matter and by geographical sub-regions of the Study Area. Comments received during the formal public review period and as a result of eight public hearings, are summarized following the final Environmental Impact Statement. Prepared by a team of federal, state, and regional officials, local citizens, and the scientific community, the plan is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound. Portions of this document are not fully legible.

PB-245 236/5GA PC$6.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Water Management Planning Report.
Final rept.
Aug 75, 174p LISS-03
Report on Long Island Sound Study. Prepared by New York State Dept. of Environmental Conservation, Albany, Environmental Protection Agency, Boston, Mass., and Connecticut Dept. of Environmental Protection, Hartford.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Water resources, *Long Island Sound, Water supply, Conservation, Water quality management, Dredging, Waste water reuse, Recreation, Sewage treatment, Industrial waste treatment, Connecticut, New York.
Identifiers: Water demand.

The water management planning report encompasses both the water quality and water supply elements of the Long Island Sound Regional Study. It is part of the final report of the

Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound. Portions of this document are not fully legible.

PB-245 237/3GA PC$5.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Land Use Planning Report.
Final rept.
Aug 75, 115p LISS-04
Report on Long Island Sound Study. Sponsored in part by Department of Housing and Urban Development, Boston, Mass. Region I. Prepared by Field (Ralph M.) and Associates, Westport, Mass., Contract HUD-H3006.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Land use, *Long Island Sound, Management, Conservation, Shores, Urban areas, Population growth, Recommendations, Water resources, Transportation, Policies, Industries, Connecticut, New York.
Identifiers: Open space land.

The planning report describes the land use element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound. Portions of the document are not fully legible.

PB-245 238/1GA PC$5.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Outdoor Recreation Planning Report.
Final rept.
Aug 75, 127p LISS-05
Report on Long Island Sound Study. Prepared by Bureau of Outdoor Recreation, Philadelphia, Pa. Northeast Regional Office.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Recreation, *Long Island Sound, Conservation, Recreational facilities, Water resources, Land use, Shores, Beaches, Swimming, Economic development, Marinas, Connecticut, New York.
Identifiers: Open space plan.

The planning report describes the outdoor recreation element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 239/9GA PC$4.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Fish and Wildlife Planning Report.
Final rept.
Aug 75, 81p LISS-06
Report on Long Island Sound Study. Prepared by Fish and Wildlife Service, Patchogue, N.Y., and National Marine Fisheries Service, Milford, Conn. Experimental Biological Investigations.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Fishes, *Wildlife, *Long Island Sound, Conservation, Fisheries, Ecology, Plant growth, Shores, Marine biology, Primary biological productivity, Connecticut, New York.
Identifiers: Ecosystems.

The planning report describes the fish and wildlife element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 240/7GA PC$5.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Shoreline Appearance and Design Planning Report.
Final rept.
Aug 75, 107p LISS-07
Report on Long Island Sound Study. Prepared in cooperation with National Park Service, Philadelphia, Pa. Northeast Region, and prepared by Mann (Roy) Associates, Inc., Cambridge, Mass.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Shores, *Long Island Sound, Conservation, Design standards, Land use, Esthetics, Objectives, Sites, Recommendations, Connecticut, New York.

The planning report describes the shoreline appearance and design element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 244/9GA PC$5.25/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Flood Damage Reduction Planning Report.
Final rept.
Aug 75, 112p LISS-11
Report on Long Island Sound Study. Prepared by Corps of Engineers, Waltham, Mass. New England Div., and Soil Conservation Service, Storrs, Conn.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Flood control, *Long Island Sound, Flood plains, Damage, Management, Flooding, Structures, Ocean tides, Coasts, Beaches, Warning systems, Flood plain zoning, Insurance, Barriers, Connecticut, New York.

The planning report describes the flood damage reduction element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 245/8GA PC$4.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Erosion and Sedimentation Planning Report.
Final rept.
Aug 75, 96p LISS-12
Report on Long Island Sound Study. Prepared by Corps of Engineers, Waltham, Mass. New England Div., and Soil Conservation Service, Storrs, Conn.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Stream erosion, *Sediments, *Long Island Sound, Land use zoning, Coasts, Water resources, Erosion control, Dredging, Classifications, Beaches, Recommendations, Vegetation, Damage assessment, Economic factors, Connecticut, New York.
Identifiers: Beach nourishment, Dredge spoil.

The planning report describes the erosion and sedimentation element of the Long Island Sound Regional Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 246/4GA PC$4.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. An Economic Perspective.
Final rept.
Aug 75, 86p LISS-13
Report on Long Island Sound Study. Prepared in cooperation with Economic Research Service, Broomall, Pa., and Bureau of Economic Analysis, Washington, D.C.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Economic development, *Long Island Sound, Demography, Land use, Water resources, Land development, Industries, Employment, Conservation, Management, New York, Connecticut.

The report examines the economic and demographic trends in the Long Island Sound region, with data for use as the basis of all projections made in the Long Island Sound Study. It is part of the final report of the Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

PB-245 247/2GA PC$8.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Shoreline Appearance and Design: A Planning Handbook.
Final rept.
Aug 75, 290p LISS-14
Report on Long Island Sound Study. Prepared in cooperation with National Park Service, Philadelphia, Pa. Northeast Region. Prepared by Mann (Roy) Associates, Inc., Cambridge, Mass.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Regional planning, *Natural resources, *Shores, *Long Island Sound, Esthetics, Coasts, Sites, Assessments, Landscaping, Urban areas, Design, Inventories, Recommendations, Vegetation, Connecticut, New York.
Identifiers: *Shorescapes.

The report contains recommended management procedures for protecting and enhancing the Long Island Sound region's scenic resources. It is part of the final report of the Long Island Sound Regional Study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound. Portions of this document are not fully legible.

PB-245 250/6GA PC$4.75/MF$2.25
Axetell (Kenneth), Jr., Alexandria, Va.
Application of the HIWAY Model for Indirect Source Analysis. User's Manual.
Final rept.,
Kenneth Axetell, Jr. Aug 75, 92p EPA/450/3-75/072

Descriptors: *Carbon monoxide, *Parking facilities, *Air pollution, *Exhaust gases, *Atmospheric motion, Motor vehicles, Concentration(Composition), Mathematical models, Vehicular traffic, Wind(Meteorology), Atmospheric models, Computerized simulation.
Identifiers: *HIWAY model, *Automobile exhaust, Indirect sources.

A procedure for characterizing emissions of carbon monoxide occurring within parking lots as line sources of pollution is described. A line source dispersion model (HIWAY) is then used to illustrate an approach for estimating the maximum impact of emissions from vehicles in parking lots on nearby 1- and 8- hour ambient concentrations of carbon monoxide.

PB-245 266/2GA PC$4.25/MF$2.25
Delaware Univ., Newark. Dept. of Chemical Engineering.
A Design and Economic Evaluation of Wet-Air and Catalytic Oxidation of Sewage Sludge.
Research rept.,
A. Gerald Fishbeck, B. E. Anshus, and J. R. Katzer. 9 May 74, 57p W75-11784, OWRT-A-014-DEL(9)

Descriptors: *Sludge digestion, *Activated sludge process, *Sewage treatment, Catalysis, Design, Oxidation, Yeasts, Organic wastes, Reaction kinetics, Cost analysis, Sewage disposal, Efficiency.
Identifiers: *Wet oxidation, *Sludge treatment.

A modification of the wet air oxidation process developed by Zimpro Incorporated is proposed. The wet air oxidation reactor is redesigned to solubilize 99% of the organic solids at a lower pressure and temperature. The resulting organic rich solution will then be passed through a heterogeneous catalytic reactor in which the organic compounds will be completely oxidized. The experimental determination of solubilization kinetics for sludge solids was performed using yeast as the sludge model because of its similarity to sludge and ease of handling. The solubilization of yeast was found to involve both rapid oxidation and slower hydrolysis reactions which followed first order kinetics in solids concentration. The rate became oxygen mass-transfer limited after the oxygen initially dissolved in the solution was consumed. The wet air catalytic oxidation process was economically similar to a typical wet air oxidation process, $4.10/ton solids processed and $3.87/ton, respectively. The wet air catalytic process achieves 99% removal of total organic carbon while the wet air oxidation process achieves only 60-70% removal and requires more severe conditions. The final products of a wet air catalytic oxidation of sludge are sanitary, easily disposed of, do not require recycle, and are essentially pollution free.

PB-245 271/2GA PC$5.25/MF$2.25
Battelle Columbus Labs., Ohio.
Review of Landspreading of Liquid Municipal Sewage Sludge.
Final rept.,
Thomas E. Carroll, David L. Maase, Joseph M. Genco, and Christopher N. Ifeadi. Jun 75, 110p* EPA/670/2-75/059-F
Contract EPA-68-03-0140

Descriptors: *Sludge disposal, *Land use, *Public health, *Solid waste disposal, Reviews, Operating costs, Sanitation, Questionnaires, Viruses, Cost estimates, Materials handling, Surveys, Soil properties, Bacteria, Sludge, Municipalities, Sewage treatment.
Identifiers: *Land disposal, Pathogens, Ultimate disposal.

The objective of this study was to review and summarize existing information regarding landspreading of liquid municipal sewage sludge. An extensive literature review was conducted and an annotated bibliography is available as a separate report from NTIS. Emphasis was also given to obtaining information concerning the number of sewage treatment plants currently using landspreading. A questionnaire survey of 1909 sewage treatment plants in Federal Regions 2, 3, 4, 5, and 9 was conducted and selected operations were visited. The information and data gathered during the study are summarized relative to sludge characteristics, sludge handling and distribution systems, economics of landspreading, sludge-soil-plant interactions, public health considerations, land acquisition, and survey of sewage treatment plants. The survey indicated that about 21 percent of the plants in the study regions are using landspreading routinely. Sixty-eight percent of the plants using landspreading have been conducting the practice for less than ten years. Of this 68 percent, over two-thirds have begun the practice only within the last five years.

PB-245 280/3GA PC$4.75/MF$2.25
New Hampshire Univ., Durham. Dept. of Civil Engineering.
The Effect of Temperature on the Aerobic Digestion of Wastewater Sludge.
Master's thesis,
Lionel R. LePage. 1974, 91p W75-11708, OWRT-A-030-NH(1)

Descriptors: *Sludge digestion, *Aerobic processes, *Sewage treatment, Temperature measurement, Settling, Filtration, Stabilization, Test methods, Theses.

Small-scale laboratory experiments were performed on an undiluted primary waste water sludge to determine the effects of temperature on the aerobic digestion process. Conclusions includes: Greater reduction in BOD, COD, total solids, and total volatile solids occur at higher temperatures; digestion for periods longer than 15 days produced only a small improvement in the degree of stabilization; the effect of temperature on the degree of stabilization was more significant at shorter detention times; no correlation was found between temperature and settleability of the sludge; the settleability of treated sludge was less than that of the raw feed sludge; higher temperatures of digestion resulted in improved filterability of the treated sludge; after 15 days digestion at higher temperatures, the filterability of the treated sludge sharply dropped; filterability of digested sludge was not as good as the filterability of the raw sludge; aerobically digested sludge had no disagreeable odor either during aeration or filtration; at 5C, a longer detention time is required to reach stabilization and to improve the characteristics of the digested sludge than at higher temperatures. The time and effort required to achieve the same degree of stabilization is much less with aerobically digested primary sludge than with anaerobically treated sludge.

PB-245 344/7GA PC$6.25/MF$2.25
United Technologies Research Center, East Hartford, Conn.
Influence of Aerodynamic Phenomena on Pollutant Formation in Combustion. Volume I. Experimental Results.
Final rept. Jul 73-Dec 74,
Craig T. Bowman, and Leonard S. Cohen. Jul 75, 159p EPA/650/2-75/061-a
Contract EPA-68-2-1092

Descriptors: *Exhaust gases, *Air pollution, *Combustion, *Aircraft, Carbon monoxide, Nitrogen dioxide, Nitrogen oxide(NO), Hydrocarbons, Methane, Propane, Fluid dynamics, Gas analysis, Gas flow, Mixing, Exhaust emissions, Gas sampling, Combustion products, Experimental design, Sources, Flames.

The report gives results of the measurement of average concentration levels of NO, NO2, CO, and unburned hydrocarbons (THC) at the exhaust of an axisymmetric combustor over a significant range of operating conditions. In addition, it gives detailed species concentration, temperature, and velocity maps throughout the combustor for seven representative operating conditions. In the combustor, natural gas, a synthesized CH4/CO/H2 fuel, or vaporized propane issued through a central duct to mix and burn with an annular air stream in a 1.8 m long cylindrical duct. In a few tests, liquid propane was the fuel. Water-cooled probes were used to remove samples from the flow for on-line concentration analysis and to measure temperature, velocity, and flow direction. Elevated pressure and introduction of swirl, to the extent considered in the present experiments, create 'unmixedness' in the combustor flow field which in turn results in enhanced NO formation and consumption of hydrocarbons. Aerodynamic flame stabilization produces strong stirring which results in relatively low NO formation and hydrocarbon consumption rates.

PB-245 407/2GA PC$3.75/MF$2.25
Southeast Michigan Council of Governments, Detroit.
A Manual Model to Predict Highway Related Carbon Monoxide Concentrations.
Final rept.,
David A. Doctor. May 75, 43p S-7501,
Transportation working paper no. 15
Contract MDSHT-74-0613
Prepared in cooperation with Michigan State Dept. of State Highways and Transportation, Lansing.

Descriptors: *Highway transportation, *Air pollution, *Carbon monoxide, *Atmospheric motion, Mathematical models, Concentration(Composition), Wind(Meteorology), Exhaust gases, Dispersing, Motor vehicles.
Identifiers: California air quality model, Automobile exhaust, DOT/5C.

This paper is intended to present the derivation of the manual model used in predicting the region's highway related carbon monoxide concentrations and explain its use in predicting concentrations under different conditions. The model incorporates the variables of meteorology, involving both atmospheric stability and wind, vehicle mix by age and the associated vehicle miles traveled, vehicle type, distinguishing between light and heavy duty vehicles, carbon monoxide emissions by year modified by average link speed, traffic volume, measured for the peak hour and eight hour hourly average, and dispersion factors for both horizontal and vertical directions. With an accurate description of a facility's design, use characteristics and meteorological conditions, very accurate prediction of the carbon monoxide concentrations on or near the facility may be made. These variables and the derivation of the model are discussed in detail in the body of this paper, leading in logical order to the assembly and use of the model.

PB-245 413/0GA PC$4.75/MF$2.25
Battelle Columbus Labs., Ohio.
Safety in Urban Mass Transportation: Guidelines Manual,
E. S. Cheaney, J. A. Hoess, R. E. Thompson, and R. L. Svehla. 5 May 75, 90p UMTA-RI-06-0005-75-2
Sponsored in part by Naval Underwater Systems Center, Newport, R.I.

Descriptors: *Urban transportation, *Safety engineering, *Manuals, Systems engineering, Systems management, Planning, Accident prevention, Safety.
Identifiers: Guidelines, Transit industries, Intermodal transportation, DOT/5A, DOT/1A.

The manual presents a series of organizational and technical safety guidelines designed for use of the transit management community. The guidelines are intended to show how the transit industry--supplier firms and operators--can develop programs that will assure satisfactory operational safety levels. By describing ways in which suppliers and operators can set logical safety goals and establish organizations and engineering procedures to attain them, the manual sets forth a model for industry management and for basing the interaction, regarding safety, between pertinent Government agencies and the transit industry.

PB-245 555/8GA PC$5.25/MF$2.25
Black and Veatch, Kansas City, Mo.
Direct Filtration of Lake Superior Water for Asbestiform Fiber Removal.
Final rept.
Jun 75, 119p EPA/670/2-75/050a
Contract DACW37-74-C-C-0079
See also PB-245 556.

Descriptors: *Water treatment, *Asbestos, *Lake Superior, *Water pollution control, Filtration, Amphiboles, Serpentive, Pilot plants, Granular materials, Diatomaceous earth, Fluid filters, Flocculating, Cost analysis, Turbidity, Design, Water supply, Minnesota.
Identifiers: Duluth(Minnesota).

Pilot plant research conducted in 1974 at Duluth, Minnesota, demonstrated that asbestiform fiber counts in Lake Superior water could be effectively reduced by municipal filtration plants. During the study, engineering data were also obtained for making cost estimates for construction and operation and both granular and diatomaceous earth (DE) media filtration plants ranging in size from 0.03 to 30 mgd. Both dual and mixed-media granular filters using alum and nonionic polymer, employing flash mix and flocculation without settling and DE filters with alum coated DE as precoat and/or body feed or with Catfloc B added to raw water, produced effluents with amphibole fiber counts below electron microscope detection limits. Turbidity was not a direct measure of fiber count, but amphibole counts were generally lowest at effluent turbidities (<or-)0.1 TU. Chrysotile removal was more difficult, but mixed media granular filtration with alum and nonionic polymer, and DE filtration with anionic polymer conditioned DE frequently reduced chrysotile fiber counts markedly.

PB-245 556/6GA PC$4.25/MF$2.25
Black and Veatch, Kansas City, Mo.
Direct Filtration of Lake Superior Water for Asbestiform Fiber Removal. Appendix A. Weather and Lake Level Data, Water Quality Data, and Raw Water Pumping Schedule.
Final rept.
Jun 75, 62p EPA/670/2-75/050b
Contract DACW37-74-C-0079
See also PB-245 557.

Descriptors: *Water treatment, *Asbestos, *Lake Superior, *Water pollution control, Filtration, Granular materials, Diatomaceous earth, Cost estimates, Serpentine, Amphiboles, Water quality, Concentration(Composition), Bacteria, Pilot plants, Tables(Data), Water supply, Dissolved gases, Oxygen, Minnesota.
Identifiers: *Water quality data, Duluth(Minnesota), Water levels, Dissolved oxygen.

Pilot plant research conducted in 1974 at Duluth, Minnesota, demonstrated that asbestiform fiber counts in Lake Superior water would be effectively reduced by municipal filtration plants. During the study, engineering data were also obtained for making cost estimates for construction and operation of both granular and diatomaceous earth (DE) filtration plants ranging in size from 0.03 to 30 mgd. This appendix contains a portion of the data collected in the study. The following categories of information are presented in Appendix A: (1) Weather and lake level data; (2) Operating schedule for pumps at the pumping station; (3) Chemical and physical quality parameters of raw and filtered water; (4) Dissolved oxygen content of raw and finished water; and (4) Bacteriological data for raw and finished water.

PB-245 557/4GA PC$4.25/MF$2.25
Black and Veatch, Kansas City, Mo.
Direct Filtration of Lake Superior Water for Asbestiform Fiber Removal. Appendix B. Design, Installation and Operation of Pilot Filters. Appendix C. Summary of Data for Individual Filter Runs.
Final rept.
Jun 75, 75p EPA/670/2-75/050c
Contract DACW37-74-C-0079
See also PB-245 558.

Descriptors: *Water treatment, *Asbestos, *Lake Superior, *Water pollution control, Filtration, Granular materials, Diatomaceous earth, Cost estimates, Equipment, Fluid filters, Water quality, Turbidity, Operations, Solids, Pilot plants, Tables(Data), Minnesota.
Identifiers: *Water quality data, Duluth(Minnesota).

Pilot plant research conducted in 1974 at Duluth, Minnesota, demonstrated that asbestiform fiber counts in Lake Superior water could be effectively reduced by municipal filtration plants. During the study, engineering data were also obtained for making cost estimates for construction and operation of both granular and diatomaceous earth (DE) filtration plants ranging in size from 0.03 to 30 mgd. Appendix B contains information on the pilot filters used in the study. Data are presented on the physical aspects of the units (dimensions and equipment configuration) and on the manner in which the filters were operated. Appendix C contains data obtained during the individual pilot plant filter runs. This kind of information will be useful to persons needing to know about specific conditions such as raw water turbidity, filtration rate, and chemical doses or diatomaceous earth types and amounts used for precoat or body feed.

PB-245 558/2GA PC$7.50/MF$2.25
Black and Veatch, Kansas City, Mo.
Direct Filtration of Lake Superior Water for Asbestiform Fiber Removal. Appendix D. Head Loss and Turbidity Curves for Individual Filter Runs.
Jun 75, 235p EPA/670/2-75/050d
Contract DACW37-74-C-0079
See also PB-245 557.

Descriptors: *Water treatment, *Asbestos, *Lake Superior, *Water pollution control, Filtration, Granular materials, Diatomaceous earth, Turbidity, Fluid filters, Pilot plants, Performance, Head losses, Potable water, Graphs(Charts), Water quality, Minnesota.
Identifiers: Duluth(Minnesota).

Pilot plant research conducted in 1974 at Duluth, Minnesota, demonstrated that asbestiform fiber counts in Lake Superior water could be effectively reduced by municipal filtration plants. During the study, engineering data were also obtained for making cost estimates for construction and operation of both granular and diatomaceous earth (DE) filtration plants ranging in size from 0.03 to 30 mgd. In Appendix D, all graphs of filter head loss and effluent turbidity as functions of the number of hours of filter operation are given. These graphs and the individual filter run data presented in Appendix C could be used to evaluate filter performance under circumstances in which the production of clear, potable water is the goal, rather than the removal of asbestiform fibers.

PB-245 559/0GA PC$3.75/MF$2.25
Transport and Road Research Lab., Crowthorne (England).
Some Environmental Impacts as Part of the Transportation Planning Process,
M. R. Wigan. 1975, 33p TRRL-Supplementary-136UC

Descriptors: *Vehicular traffic, *Noise pollution, Exhaust emissions, Pedestrians, Mathematical models, Urban transportation, Urban planning, Air pollution, Environmental impact, Correlations, Great Britain.

The analysis of traffic and transport alternatives by mathematical and computer models is well established, and has proved to be an effective tool for comparison of different alternative policies. The emphasis of these models has in the past been on the traffic and transport aspects of the plans assessed: recently methods have been devised to provide approximate estimates of the noise, pollution, and pedestrian interference aspects of traffic. This paper describes a method for bringing these estimation procedures within the scope of a traffic model so that these environmental effects can be considered together with transport consequences.

PB-245 575/6GA PC$8.50/MF$2.25
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Awards Register Grants Assistance Programs. Volume I. Listing Awards During the 2nd Half of FY 1975, Except State and Local Assistance Awards.
Sep 75, 260p* EPA/GAD/1-75/003
See also PB-245 576.

Descriptors: *Grants, *Air pollution control, *Water pollution control, *Solid waste disposal, Radioactive wastes, Tables(Data), Research projects, Sewage treatment, Pesticides, Hazardous materials, Personnel development.

The publication lists all the second Half of Fiscal Year 1975 Grants Awards by the United States Environmental Protection Agency except State and Local Assistance awards. The format of the publication is to have the initial sort by states, then by the various grant programs then awards to grantees in the State. Each entry consists of the identification of the grantee, the program area - for example water or air, the project title, grant number, award date, and dollar amount. Section II of the volume contains a 250 word description of most research and demonstration projects.

PB-245 576/4GA PC$9.25/MF$2.25
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Awards Register Grants Assistance Program. Volume II. Awards During the 2nd Half of FY 1975 Listing State and Local Assistance Awards.
Sep 75, 311p* EPA/GAD/1-75/004
See also PB-245 575.

Descriptors: *Grants, *Air pollution control, *Water pollution control, *Solid waste disposal, Radioactive wastes, Tables(Data), Research projects, Sewage treatment, Pesticides, Hazardous materials, Construction, Personnel development.

The publication lists all the second Half of Fiscal Year 1975 by the United States Environmental Protection Agency in State and Local Assistance Awards. The format of the publication is to have the initial sort by states, then by the various grant programs then awards to grantees in the State. Each entry consists of the identification of the grantee, the program area - for example water or air, the project title, grant number, award date, and dollar amount.

PB-245 599/6GA PC$3.75/MF$2.25
Pacific Northwest Environmental Research Lab., Corvallis, Oreg.
Lake Ontelaunee, Berks County, Pennsylvania.
Final rept.
Jun 75, 40p Working Paper-422
Prepared in cooperation with National Environmental Research Center, Las Vegas, Nev., Pennsylvania Dept. of Environmental Resources, Harrisburg, and Pennsylvania National Guard, Harrisburg.

Descriptors: *Water pollution, *Lake Ontelaunee, Surveys, Inorganic phosphates, Inorganic nitrates, Bioassay, Primary biological productivity, Chemical properties, Water quality, Drainage, Nutrients, Sources, Tables(Data), Pennsylvania.
Identifiers: Eutrophication, *Water quality data, Berks County(Pennsylvania).

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

PB-245 615/0GA PC$10.25/MF$2.25
Wisconsin Dept. of Natural Resources, Madison. Div. of Environmental Standards.
Water Pollution Investigation: Lower Green Bay and Lower Fox River.
Final rept.,
D. J. Patterson, E. Epstein, and J. McEvoy. Jun 75, 376p EPA/905/9-74/017
Contract EPA-68-01-1572

Descriptors: *Stream pollution, *Fox River, *Lake Michigan, *Green Bay, Sources, Surveys, Aquatic biology, Plankton, Algae, Dissolved gases, Oxygen, Inorganic phosphates, Inorganic nitrates, Mathematical models, Concentration(Composition), Computerized simulation.
Identifiers: *Water quality data, Dissolved oxygen.

The lower third of Green Bay and the Lower Fox River were intensively studied. Seven surveys of the Bay were carried out between September 1973 and September 1974. Over 40 stations were sampled for 15 different chemical and physical chemical and physical parameters. In addition, plankton samples were taken and general groupings and counts were made. Nearly 5,000 data points were generated and inserted into the STORET system. The surveys revealed algae blooms over the entire study area. Nitrogen forms showed fluctuations over 3 orders of magnitude that may be relatable to nitrogen-fixing algae. Phosphorus concentrations were more stable than nitrogen concentrations, but appeared to decrease in correspondence to blue-green nitrogen-fixing algae. Dissolved oxygen concentrations in the Bay were generally acceptable except during the winter survey. The February survey revealed critical dissolved oxygen levels over a 50 sq. mile area north of Point Sable. Computer models of the Lower Fox River and Green Bay were developed and used to evaluate the effect of the final limits for the present discharge permits at all point source discharges on the water quality, specifically dissolved oxygen.

PB-245 733/1GA PC$4.25/MF$2.25
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
Report on Androscoggin River, New Hampshire-Maine.
Aug 62, 68p

Descriptors: *Stream pollution, *Industrial wastes, *Sewage, *Androscoggin River, Bacteria, Sedimentation, Biochemical oxygen demand, Concentration(Composition), Tables(Data), Turbidity, New Hampshire, Maine.
Identifiers: *Water quality data.

The report presents a view of existing data and certain calculations based on stream function and behavior. The effects of wastes on water quality are discussed, along with a discussion of the uses of the water and damages to water uses created by wastes.

PB-245 744/8GA PC$4.25/MF$2.25
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
Report on Pollution of Interstate Waters of the Connecticut River. Massachusetts-Connecticut.
Nov 63, 65p
See also report dated 2 Dec 63, PB-229 717.

Descriptors: *Stream pollution, *Connecticut River, Industrial wastes, Sewage, Bacteria, Dissolved gases, Oxygen, Biochemical oxygen demand, Connecticut, Massachusetts.
Identifiers: *Water quality data, Interstate rivers, Dissolved oxygen.

The report examines the pollution found in the Connecticut River. The uses of the water are described along with the sources of waste. Conclusions are drawn from the effects of pollution on water quality and uses.

13C. Construction Equipment Materials, and Supplies

N75-30607/6GA PC$3.75/MF$2.25
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Investigation of the Manufacture of Building Materials by Carbonation Hardening of Slaked Lime.
O. Matsuda, and H. Yamada. 1975, 26p
NRC/CNR-TT-1807, ISSN-0470-2557
Tran-Transl. Into English from Sekko to Sekkai (Tokyo), No. 125, 1973 p 170- 179.

Descriptors: *Calcium oxides, *Carbon, *Hardening (Materials), Chemical composition, Construction materials, Pressing (Forming), Reaction kinetics.
Identifiers: Translations.

For abstract, see STAR 1321

PAT-APPL-603 422/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Endless Conveyor System.
Patent Application,
Filed 11 Aug 75, 15p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Belt conveyors, *Patent applications, Beading, Elastic properties, Bulk handling, Rollers, Mechanical guides, Curves(Geometry).

The patent application describes an endless conveyor apparatus capable of transverse bending to negotiate a curve lying substantially in a horizontal plane. Pretensioned elongated elastic beads attached to the edges of a flexible endless conveyor belt accomplishes this by accommodating the difference in travel required by the bend radius differential. Rollers on the frame of the apparatus engage the elastic beads supporting and driving the belt. A spine may be provided along the longitudinal center line of the conveyor and may be engaged by a plurality of pairs of guide wheels. The elastic beads are shorter than the load portion of the belt to provide for the pretensioning function. Laterally extending corrugations assist in accommodating the transverse bending action and flexible cross lines extend along the corrugations supported from the elastic beads.

PB-245 568/1GA PC$4.80/MF$2.25
Transportation Research Board, Washington, D.C.
Corrosion, Concrete, Quality Control and Paint Beads,
Don L. Spellman. 1975, 119p* TRB/TRR-539, ISBN-0-309-02390-4

Descriptors: *Concretes, *Concrete pavements, *Corrosion, *Highways, Concrete durability, Radioactivation analysis, Galvanized materials, Culverts, Beads, Reflectors, Corrugated metal pipes, Steels, Trafficability, Surfaces, Aggregates, Portland cements, Quality control.
Identifiers: Highway markings, Glass beads.

The papers in this Record are of interest to researchers and practicing engineers alike. They include (a) a discussion of the historical development of curing materials in the California Division of Highways since 1967; (b) an examination of the effects of rapid freezing rates on the deterioration of concrete; (c) a field-testing method for measurement of the cement content of concrete using activation analysis with californium-252; (d) a description of a field test method to measure corrosion reaction rates of corrugated metal pipe; (e) an investigation of 287 galvanized culverts through visual observation and electrical tests to define the degree of corrosiveness; (f) an evaluation of corrosion investigation techniques; (g) a

description of the experiences of the Pennsylvania Department of Transportation and Pennsylvania State University in the educational process to develop a program of implementing statistically oriented end-result specifications; (h) a description of the process of developing a statistically based specification for the rolling straightedge used to measure surface irregularities; (i) an examination of the precision of standard tests such as sieve analysis, percentage of crushed particles, L.A. abrasion, sand equivalent, cleanness value, durability index, and R-value through an interlaboratory correlation program; (j) an evaluation of the 2 most common types of floating beads, narrow and broad gradation; and (k) a study of the effectiveness of Missouri's traffic delineation system on both concrete and asphalt concrete pavements.

13D. Containers and Packaging

Y-1972 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Analysis of Stresses in Filament-Wound Spherical Pressure Vessels Produced by the delta-Axisymmetric Pattern.
C. E. Knight, Jr.. 8 Aug 75, 82p
Contract W-7405-eng-26

Descriptors: (*Pressure vessels, *Fabrication), Composite materials, Design, Filaments, Finite element method, Spheres, Stress analysis.

For abstract, see NSA 32 08, number 19534.

13E. Couplings, Fittings, Fasteners, and Joints

N75-30593/8GA PC$3.25/MF$2.25
National Aerospace Lab., Amsterdam (Netherlands). Structures and Materials Div.
Fretting and Fatigue of Pin-Loaded Lugs under Complex Loads.
H. P. Vanleeuwen, A. Nederveen, and H. H. Ruiter. Sep 73, 12p NLR-TR-73127-U

Descriptors: *Fatigue life, *Fretting corrosion, *Load distribution (Forces), *Lugs, Aluminum alloys, Fatigue tests, Protective coatings.

For abstract, see STAR 1321

PAT-APPL-428 533/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Ordnance Alignment and Loading Apparatus.
Patent Application,
Frank L. Scheetz, Francis E. Buck, and William B. Shepard. Filed 26 Dec 73, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aircraft, *External stores, *Alignment, Patents, Pins, Inflatable structures, Latches.
Identifiers: PAT-CL-89-1-5, *Patent applications.

The patent application relates to an apparatus for automatic final alignment and latching of ordnance to aircraft including a pair of diagonally opposed pin and cone sets demountably attached to the ordnance and aircraft respectively, lug and latch sets similarly attached, and a pair of inflatable bags supporting a platform on which the ordnance rests. Upon completion of approximate alignment, a lifting force is imparted to the weapons by inflation of the bags, causing smooth mating of the pins and cones and final fastening of the lugs and latches.

PAT-APPL-481 007/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Torsionally and/or Axial Soft Coupling.
Patent Application,
Alfred B. Harbage. Filed 20 Jun 74, 11p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Marine propulsion, *Flexible couplings, Patents, Drive shafts, Vibration, Propellers(Marine).
Identifiers: *Patent applications, PAT-CL-64-11-11-R.

The patent application relates to a flexible rotary shaft coupling for marine use in a propeller shaft that isolates the vibration caused by axial forces on the propeller passing through an uneven wake. Torque is carried by a solid pin and link arrangement which produces negligible axial resistance. The coupling housing is substantially cup-shaped on one side and has a plunger on the other side and contains a very dense liquid or a very dense soft rubber mass formed to a hollow cylindrical shape within the coupling due to centrifugal force. This mass resists the fluctuating forces by the variation of the inside diameter of the hollow cylinder formed by centrifugal forces during rotation. Variation of stiffness of the cylindrical column is achieved by varying the distance between the coupling faces or sides.

13F. Ground Transportation Equipment

PB-244 761/3GA PC$6.25/MF$2.25
Labor/Management Task Force on Terminals.
A Program of Experiments Involving Changes in Terminal Operations on the St. Louis Terminal Division Missouri Pacific Railroad.
Progress rept.
1 Mar 75, 174p
Contract DOT-FR-4-3003
Prepared in cooperation with Missouri Pacific Railroad Co., St. Louis, Terminal Div., and Association of American Railroads, Washington, D.C.

Descriptors: *Railroad terminals, *Rail transportation, Services, Reliability, Regulations, Government policies, Management engineering, Employment, Labor relations, Investments, Market research.
Identifiers: Saint Louis(Missouri), DOT/2C, DOT/3K.

The document reports on the progress of the St. Louis Terminal Project sponsored by the Labor/Management Committee involving the coordinated efforts of labor, management and government. A description of the formation of the project, its objectives, its techniques and outlines of specific experiments are provided. The report demonstrates the ability of labor and management to work together successfully and the understanding that terminal operations are exceedingly complex and inter-related and the resolution of terminal problems will take time and effort.

PB-245 221/7GA PC$7.25/MF$2.25
Bechtel, Inc., Gaithersburg, Md.
Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 9: Technical and Economic Analysis of Vehicle/Right of Way Systems. Volume I.
Final rept.,
K. L. Lawson, R. H. Prause, C. W. Gillespie, J. H. Wujek, and R. C. Arnlund. Aug 75, 225p
FRA/ONECD-75/9-Vol-1
Contract DOT-FR-40027
See also PB-242 445 and Volume 2, PB-245 222.

Descriptors: *Rapid transit railways, *Transportation management, *Regional planning, Improvement, Travel, Time, Objectives, District of Columbia, Mathematical models, New York, Massachusetts, Land, Electric propulsion, Railroad cars, Cost effectiveness, Kinematics, Railroad bridges, Railroad tunnels, Dynamic braking, Safety, Human factors engineering, Comfort, Performance evaluation.
Identifiers: Northeast corridor, Right of way(Land), Multiple unit cars.

This report presents the results of a study performed to define the combination of vehicle and right-of-way characteristics which best meets objectives for upgrading passenger service on the Northeast Corridor. The specific goals of this rail system are 2-1/2 hours travel time between Washington, D.C. and New York City with five stops, and 3 hours travel time between New York City and Boston with five stops. Consideration of technical, economic and intangible factors leads to the conclusions that certain right-of-way improvements should be implemented and that multiple unit electric (MU) cars should be used. Volume One discusses high speed technology, power concepts, vehicle design, kinematics, safety, comfort, train performance, and some mathematical formulations.

PB-245 222/5GA PC$7.50/MF$2.25
Bechtel, Inc., Gaithersburg, Md.
Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 9: Technical and Economic Analysis of Vehicle/Right of Way Systems. Volume II.
Final rept.,
K. L. Lawson, R. H. Prause, C. W. Gillespie, J. H. Wujek, and R. C. Arnlund. Aug 75, 245p
FRA/ONECD-75/9-Vol-2
Contract DOT-FR-40027
See also PB-242 445 and Volume 1, PB-245 221.

Descriptors: *Rapid transit railways, *Transportation management, *Regional planning, Improvement, Services, Passenger transportation, Land, Cost engineering, Economic analysis, Technology, Performance evaluation, Railroad cars, Environmental impacts.
Identifiers: Tilt body suspensions, Northeast corridor, Right of way(Land).

This document contains the results of a study performed to define the combination of vehicle characteristics and right-of-way improvements which best meets the Corridor Rail objectives for upgrading passenger service on the Northeast Corridor. Volume Two of a two-part report deals with economic inputs of rolling stock, electrification, shop construction, track maintenance, and service demand. Costs, planning, and systems engineering are discussed, along with tradeoffs, environmental considerations, and vehicles, with particular attention to tilt body design.

PB-245 229/0GA PC$3.75/MF$2.25
Transport and Road Research Lab., Crowthorne (England).
The Harlow Dial-A-Bus Experiment,
B. E. Speller, and C. G. B. Mitchell. 1975, 26p
TRRL-Supplementary-127UC

Descriptors: *Passenger transportation, *Buses(Vehicles), Great Britain, Adaptive systems, Experimental design, Systems engineering, Operations, Financing, Performance evaluation, Data acquisition, Public opinion, Social effect, Surveys, Urban transportation.
Identifiers: *Dial a bus systems, *Harlow(Great Britain).

The design and implementation of an experimental dial-a-bus system in Harlow are described. At the time of implementation this was the largest dial-a-bus system in Britain. To facilitate the design of further systems the mode of operation, chronology of major events and financial aspects are presented in some detail. The program of research and evaluation of the experiment is also discussed.

PB-245 612/7GA PC$7.25/MF$2.25
West Va. Dept. of Highways, Charleston.
Traffic Signal Warrant for Heavy Traffic Volumes Occurring During Short Periods of Time. (A Tentative Peak Hour Delay Warrant).
Final rept.
Apr 75, 203p WVDOH-38
Prepared by Smith (Wilbur) and Associates, Washington, D.C.

Descriptors: *Traffic signals, *Intersections, *Demand(Economics), Time, Requirements, Placing, Volume, Delay time, Vehicular traffic, Statistical data, West Virginia, California, Connecticut, Texas, Suburban areas, Rural areas.
Identifiers: Peak traffic flow, Short duration, DOT/5L.

This report presents results of research efforts designed to develop a tentative standard for determining the need for traffic signals at isolated intersections which are subject to short-duration heavy volume peaking characteristics. The suggested standards, or warrants, are based on volume-delay counts obtained at selected typical intersections and comparable data from other research and simulation studies. Warrant values were tested using similar data from six locations, three in West Virginia, and one each in California, Connecticut and Texas. The intersection configurations and conditions used in this report were three-way intersections located mainly in suburban and rural areas.

PB-245 685/3GA PC$4.25/MF$2.25
Transport and Road Research Lab., Crowthorne (England).
Dial-A-Bus Demand Modelling and Evaluation: Predictions for the Harlow Experiment,
P. H. Martin. 1975, 53p TRRL-Supplementary-154UC
Also pub. as ISSN-0305-1315.

Descriptors: *Passenger transportation, *Buses(Vehicles), Urban transportation, Great Britain, Demand(Economics), Economic models, Mathematical prediction, Consumer affairs, Experimental design, Services, Performance evaluation, Statistical data.
Identifiers: *Dial a bus systems, *Harlow(Great Britain), Ridership, Modal split.

This report describes the demand model and benefit analysis which will be used in the assessment of dial-a-bus as a form of public transport in the United Kingdom. A modal-split model is used to determine the diversion of patronage to the new mode and the benefits of time and resource savings are calculated by conventional methods. As an example of the use of these techniques, a detailed prediction of the patronage and benefits of the Harlow dial-a-bus experiment is reported. The results of this analysis are used to indicate improvements to the demand model which may be incorporated into subsequent studies.

13G. Hydraulic and Pneumatic Equipment

AD-A016 049/9GA PC$4.25/MF$2.25
Purdue Univ Lafayette Ind Project Squid Headquarters
Axial Flow Rotor Unsteady Response to Circumferential Inflow Distortions.
Summary rept. 1 Oct 73-30 Sep 74,
E. P. Bruce, and R. E. Henderson. Aug 75, 53p Rept no. SQUID-TR-PSU-13-P
Contract N00014-67-A-0226-0005
Prepared in cooperation with Pennsylvania State Univ., University Park. Applied Research Lab.

Descriptors: *Turbomachinery, *Fluid dynamics, Axial flow fans, Nonuniform flow, Dynamic response, Rotor blades(Turbomachinery), Flow fields, Distortion, Velocity, Subsonic characteristics, Test methods, Theory, Mathematical prediction, Angles, Test equipment, Force(Mechanics), Moments.
Identifiers: Unsteady flow, Inflow, Squid project.

The unsteady response of an axial flow fan rotor to steady, circumferential inflow velocity distortions has been evaluated by investigation of the unsteady normal force and pitching moment on a chordwise element of a rotor blade. Experimental measurements of these unsteady characteristics are presented as a function of the geometry of the rotor -- stagger angle, solidity and steady angle of incidence -- for sinusoidally varying circumferential distortions with different numbers of distortion cycles. These measurements are compared with two theoretical analyses. Clearly indicated is the existence of an unsteady cascade effect and the ability of the theories to adequately predict the trend of the unsteady response due to variations in reduced frequency, rotor stagger angle, solidity and mean incidence angle.

N75-30566/4GA PC$5.75/MF$2.25
Mechanical Technology, Inc., Latham, N.Y.
Flexible Rotor Balancing by the Influence Coefficient Method: Multiple Critical Speeds with Rigid or Flexible Supports.
Final Report.
J. M. Tessarzik. Aug 75, 130p NASA-CR-2553, MTI-75TR3
Contract NAS3-14420

Descriptors: *Bending moments, *Critical velocity, *Influence coefficient, *Rotor aerodynamics, Force distribution, Laser applications, Loads (Forces), Moment distribution, Vibration.

For abstract, see STAR 1321

PAT-APPL-454 886/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Slam/Shock Isolation Pedestal.
Patent Application,
Edward V. Pickford, Richard M. Mahone , and Herbert L. Wolk. Filed 26 Mar 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Boats, *Shock absorbers, Patents, Hydraulic equipment, Dashpots, Springs, Slamming.
Identifiers: PAT-CL-248-400, *Patent applications.

The patent application relates to a mount for a chair, piece of machinery, etc. that is exposed to rapid low-acceleration slams and intermittent high-acceleration shocks. The mount has a spring which absorbs the rapid slams and a hydraulic or pneumatic dashpot which absorbs the shocks; the dashpot does not function over the first increment of travel of the mount, thereby allowing rapid recycling of the mount under conditions of rapidly applied slams.

PATENT-3 898 882 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Flow Measuring Apparatus.
Patent.
P. R. Prokopius. Patented 12 Aug 75, 8p PAT-APPL-447 124
Misc-Filed 28 Feb. 1974 Supersedes N74-18101 (12 - 09, p 1050).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Binary fluids, *Flow measurement, *Fluid flow, *Fluidic circuits, *Gas flow, Equipment specifications, *Patents, Production engineering.
Identifiers: PAT-CL-73-194-M.

Apparatus for measuring the mass flow rates of the components comprising a binary gas mixture is provided. This is accomplished by directing a binary fluid or gas through a fluidic humidity sensor and then through a calorimeter which increases the temperature of the flowing binary gas. Electrical signals provided by the fluidic humidity sensor, the flow calorimeter, and a power supply which energizes or heats the calorimeter are operated in a predetermined manner to provide an output signal indicative of the mass flow rate of one of the binary gases. Thus, the mass flow rate of the other gas is allowed to be determined since the total mass flow rate is previously calculated by the instrument and is the output of operating module 19.

13H. Industrial Processes

AD-A015 728/9GA PC$3.25/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
Effects of Purity and Processing on the Exfoliation Corrosion Behavior of 7X75 Aluminum Plate.
Final rept. Mar 74-Jan 75,
Peter J. Blau. Jul 75, 22p Rept no. AFML-TR-75-43

Descriptors: *Corrosion, *Aluminum alloys, *Exfoliation, *Processing, Metal plates, Cracks, Thermomechanics, Iron, Silicon, Purity.

The effect of varying iron and silicon content on the exfoliation corrosion behavior of two 7x75 type wrought aluminum alloys was investigated using the ASTM EXCO test. One series of alloy plates (5/8 inch thick) was basically the composition of 7475 with total iron and silicon varying in five steps between 0.03 and 0.31 weight percent. The other series contained Zr in place of Cr in the basic composition, and had a comparable variation in iron and silicon content. Each of the two series was processed both in the standard T651 temper and by a thermomechanical process (TMP). Twenty different combinations of composition and processing were studied this way. Test results showed that, in general, the variation in iron and silicon content had no significant effect on exfoliation resistance in either temper or alloy series. Corrosive attack on the TMP coupons was more uniform than on the T651 coupons. Long subsurface cracks were observed in the T651 coupons. Machined sides of the TMP coupons showed almost no attack, while those of the T651 coupons pitted. The depth of attack was about 1.5 times greater on the rolled surfaces of T651 coupons compared to TMP coupons. End-grain attack depth of T651 coupon sides was three times that of TMP coupon sides. (Author)

AD-A015 860/0GA PC$5.75/MF$2.25
Northrop Corp Hawthorne Calif Aircraft Div
Low-Temperature Large-Area Brazing of Titanium Structures.
Final rept. 1 Jul 73-31 Jan 75,
R. R. Wells. Jun 75, 127p Rept no. NOR-75-30 AFML-TR-75-50
Contract F33615-73-C-5161

Descriptors: *Brazing, *Titanium alloys, *Laminates, Brazing alloys, Damage, Tolerance, Airframes.
Identifiers: Titanium alloy 6Al 2Sn 6V, Titanium alloy 6Al 4V, Titanium alloy 3Al 6Cr 4Mo 8V, 4Zr.

Various brazing filler metals were identified and brazing processes established for producing large-area damage-tolerant laminates of Ti-6Al-4V, Ti-6Al-6V-2Sn, and Ti-3Al-8V-6Cr-4Mo-4Zr (Beta C) for service between 227 K and 422 K (-50F and 300F). Low melting-temperature filler metals were identified to permit the fabrication of laminates in the STA condition. Brazing filler

metals were screened based upon their flow temperature and behavior, lap shear strength, bend deflection, and corrosion resistance. The most attractive brazing filler metals were aluminum brazing sheet 22 and alloys from the Al-Cu-Ag system. The brazing sheet was placed between the lamina and the Al-Cu-Ag alloys were placed alongside the lamina and flowed into the joints.

AD-A015 894/9GA PC$4.75/MF$2.25
Nuclear Metals Inc Concord Mass
Development of Hot Isostatic Pressing Techniques for Producing High Quality Billet from Titanium Alloy Powder.
Final rept. 1 Jul 73-31 Mar 75,
Gerald Friedman. Apr 75, 99p AFML-TR-75-9
Contract F33615-73-C-5092

Descriptors: *Hot pressing, *Isostatic pressing, Titanium alloys, Powder alloys, Compacting, Billets, Powder metallurgy, Aluminum alloys, Tin alloys, Vanadium alloys, Forging, Extrusion.
Identifiers: Titanium alloy 6Al 2Sn 6V.

The purpose of the program was to establish the relationships between consolidation and mechanical working conditions and the structure and mechanical properties of two types of Ti-6Al-6V-2Sn powders. The program required converting Ti-6Al-6V-2Sn ELI bar from a single heat to powder by two different techniques, the hydridedehydride process and the Rotating Electrode Process. The powders were to be fully characterized, and a portion consolidated by hot isostatic pressing. Billet portions representing each isostatic consolidation condition were to be examined to determine the relationships between powder type and size, consolidation practice, microstructure, and mechanical properties.

AD-A016 144/8GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Selection of Optimum Capital Expenditures During the Designing of an ASU,
V. V. Lobanov, S. V. Kozachenko, and L. S. Lobanova. 9 May 75, 9p Rept no. FTD-ID(RS)I-1319-75
Edited trans. of Tekhnologiya i Organizatsiya Proizvodstva (USSR) n1 p4-5 1972, by Catherine M. Barber.

Descriptors: *Production control, *Control systems, *Investments, Translations, USSR.
Identifiers: *Automatic control.

The report discusses selecting the optimum capital expenditures in the creation of an automatic control system.

NTIS/PS-75/764/1GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Inert Gas Welding (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
William E. Reed. Oct 75, 118p*

Descriptors: *Bibliographies, *Inert gas welding, Welded joints, Automation, Nondestructive tests, Steels, Aluminum, Titanium, Fabrication.

The Federally-sponsored research reports cited deal with the development of techniques and procedures for inert gas welding and with the characteristics of the resulting welds. Process control, automation, nondestructive testing, and health hazards are also investigated. Metals welded include steel, titanium, aluminum, uranium, and refractory metals. (Contains 113 abstracts).

NTIS/PS-75/771/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Diffusion Bonding (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
William E. Reed. Oct 75, 147p*

Descriptors: *Diffusion welding, *Bibliographies, Bonded joints, Fabrication, Mechanical properties, Diffusion.
Identifiers: Diffusion bonding.

The processing, metallurgical techniques, diffusion phenomena, bonding mechanisms, and mechanical properties of diffusion bonded joints are investigated in the cited Federally-sponsored research reports. Materials bonded include stainless steels, refractories, titanium, dissimilar metals, composites, reactor fuels, and silicon wafers. (Contains 142 abstracts).

N75-30257/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Chemical Reactions of Metal Powders with Organic and Inorganic Liquids During Ball Milling.
A. Arias. Sep 75, 27p NASA-TN-D-8015, E-8369

Descriptors: *Inorganic compounds, *Metal powder, *Milling (Machining), Chemical reactions, Contamination, Powder metallurgy.

For abstract, see STAR 1321

N75-30573/0GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Ultrasonic Inspection and Control of Weldments in High Pressure Vessel.
L. X. Nepomuceno, and E. S. C. Barrios. 3 Feb 75, 5p REPT-7502.762
In Portuguese; English Summary.

Descriptors: *Pressure vessels, *Ultrasonic tests, *Welded joints, Nondestructive tests, Quality control, Reliability engineering.

For abstract, see STAR 1321

N75-30582/1GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Ultrasonic Inspection and Control of Cast Steel Parts Designed to Gear Machining.
L. X. Nepomuceno, and E. S. C. Barrios. 19 May 75, 8p REPT-7505.787
In Portuguese; English Summary.

Descriptors: *Steels, *Ultrasonic tests, Gears, Nondestructive tests, Quality control, Reliability engineering.

For abstract, see STAR 1321

N75-30583/9GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Ultrasonic Inspection and Control of the Weldments of Equipment Installed in Hydroelectric Power Plant.
L. X. Nepomuceno, and E. S. C. Barrios. 23 Jun 75, 12p REPT-7506.795
In Portuguese; English Summary.

Descriptors: *Ultrasonic tests, *Welded joints, Nondestructive tests, Quality control, Reliability engineering.

For abstract, see STAR 1321

N75-30586/2GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Ultrasonic Inspection of the Weldments in Undersea Prospection Platform.
L. X. Nepomuceno, and E. S. C. Barrios. 4 Feb 75, 21p REPT-7502.763
In Portuguese; English Summary.

Descriptors: *Ultrasonic tests, *Underwater engineering, *Welded joints, Graphs (Charts), Nondestructive tests, Reliability engineering.

For abstract, see STAR 1321

PAT-APPL-465 795/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
An Improved Chill Block.
Patent Application,
C. E. Mabley, and R. E. Masinger. Filed 1 May 74, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Metal spinning, Patents, Metal fibers, Cooling, Chaff.
Identifiers: *Chill blocks, *Patent applications, PAT-CL-164-272.

The patent application disclosed herein provides an improved chill block for continuous manufacturing of a multiplicity of metal ribbon fibers by providing a rotating chill block with alternate bands of high and low thermal capacity to allow shear between fibers in high and the low conductivity bands.

PATENT-3 898 730 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Bonding Method in the Manufacture of Continuous Regression Rate Sensor Devices.
Patent.
W. H. Haraway, Jr., W. J. Dale, and E. A. Mcerlean. Patented 12 Aug 75, 8p PAT-APPL-424 038
Misc-Filed 12 Dec. 1973 Supersedes N74-14141 (12 - 05, p 0540).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Bonding, *Composite structures, *Laminates, *Manufacturing, *Phenolic resins, *Sensors, Equipment specifications, *Patents, Quality control.
Identifiers: PAT-CL-29-613.

In a method for manufacturing continuous regression rate sensor devices, at least two retaining members are derived from a phenolic-graphite or a 50:50. Phenolic-nylon material are interbonded one to another to form a cavity where an ablation regression grid sensor is positioned.

PB-245 120/1GA PC$7.25/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
Exploratory Research in Industrial Modular Assembly.
Semi-Annual progress rept. 1 Jun 73-31 Jan 74,
J. L. Nevins, D. E. Whitney, and H. J. Doherty. Mar 74, 206p R-800 NSF/RA-T-74-058
Grant NSF-GI-39432

Descriptors: *Assembling, *Automatic control equipment, Manipulators, Automatic control, Process control, Numerical control, Detectors, Automation, Computer applications.

This report explores in detail the research issues associated with a new class of systems for performing automatic mechanical assembly organized about sensor arrays for measuring the forces present when two pieces interact during the process of assembly. The research issues covered by this report include methods for clas-

sifying mechanical assembly, assembler system configurations of interest to assembly classes, associated motion regimes and control strategies, and a general error analysis for predicting performance requirements for the assembler system of the modeling of the statistical errors associated with parts variation. In addition, detail studies cover the design requirements for an experimental assembler system (called POPEYE) for the range of assembly tasks covered by a volumetric range of 0.3 cubic meters (1 cubic foot) to 1.0 meter cubed (3.08 cubic feet). These detail studies included various mechanical assemblies, arm and actuator configuration studies, software system, computer configurations, and summaries of the related development activities for the assembler system and actuators, sensor arrays, computer systems, interface electronics, and control algorithm development.

PB-245 204/3GA PC$3.25/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
Exploratory Research in Industrial Modular Assembly. A Status Report.
Conference paper,
J. L. Nevins, and D. E. Whitney. Aug 74, 23p P-101 NSF/RA/R-74-100
Grants NSF-GI-139432, NSF-GI-43787

Descriptors: *Assembling, *Automatic control equipment, Automatic control, Machine tools, Industrial engineering, Detectors, Systems engineering, Automation.

The applied research issues being explored for a new class of systems for performing automatic mechanical assembly are described. These systems are organized about sensor arrays that measure the forces present when two pieces interact during the process of assembly. The research issues described include methods for classifying mechanical assembly, assembler system configurations of interest to assembly classes, associated motion regimes and control strategies, task analysis, sensor and servo integration, sensor systems, and experiments under way to verify the proposed strategies.

13I. Machinery and Tools

AD-A015 947/5GA PC$4.25/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
Landing Craft Shock Absorber Measurements.
Research and development rept. Jul-Aug 74,
Kenneth G. Morris. Dec 74, 55p Rept no. NSRDC-4337

Descriptors: *Landing craft, *Shock absorbers, *Nose wheels, Aircraft equipment, Protection, Installation, Force(Mechanics), Ship motion, Data processing, Transducers, Measurement, Feasibility studies, Sea testing.
Identifiers: Fenders.

Trials were conducted in July and August 1974 to study the response of an aircraft nose-wheel assembly when mounted as a protective fender on a landing craft. Under the sponsorship of the Office of Naval Research, the Underwater Explosions Research Division of the Naval Ship Research and Development Center provided instrumentation and data processing services required to measure forces and motions produced during operations of a landing craft alongside a larger vessel. This report provides the experimental data obtained during the trials. (Author)

AD-A015 990/5GA PC$5.25/MF$2.25
Norton Co Worcester Mass Industrial Ceramics Div
Silicon Nitride in Rolling Contact Bearings.
Final rept. 15 Mar 74-15 Jul 75,
H. Robert Baumgartner, and Paul E. Cowley. Aug 75, 112p
Contract N00019-74-C-0157

Descriptors: *Roller bearings, *Silicon nitrides, Ceramic materials, Bearings, Fatigue tests(Mechanics), Endurance(General), Performance(Engineering).

The program (1) investigated silicon nitride material characteristics in relation to bearing performance and (2) endurance tested bearings containint silicon nitride components. Six hot-pressed silicon nitride compositional variations were prepared, characterized and evaluated in rolling contact fatigue (RCF). All ceramic fatigue lives equalled or exceeded the fatigue life of M-50 steel at the 325 pound load. A stress corrosion mechanism is used to explain the time dependent ceramic fatigue behavior and life differences are attributed to differences in slow crack growth rates. Ten precision, 60 mm bore, roller bearings, containing silicon nitride rollers, steel races and retainer, were designed, fabricated and endurance tested at a radial load of 5050 pounds and shaft speed of AFBMA calculated L(10) life of 21.6 hours for a similar all steel bearing.

AD-A016 084/6GA PC$3.25/MF$2.25
Cincinnati Univ Ohio Dept of Aerospace Engineering
Erosion Prediction in Turbomachinery Resulting from Environmental Solid Particles,
G. Grant, and W. Tabakoff. 1 Mar 74, 9p ARO-10223.7-E
Grant DA-ARO-D-31-124-71-G154
Presented at the AIAA Aerospace Sciences Meeting (12th), Washington, D. C. 30 Jan-1 Feb 74, Paper 74-16.
Availability: Pub. in Jnl. of Aircraft, v12 n5 p471-478 May 75.

Descriptors: *Turbomachinery, Erosion, Solids, Particles, Impact, Aerodynamics, Computerized simulation, Rotor blades, Monte Carlo method, Drag, Compressors, Reprints.

The erosion resulting from solid particles ingested into rotating machinery is predicted using a Monte Carlo simulation of the physical process. This simulation takes into account the aerodynamic drag on the contaminant particles, the rebound dynamics of the particles impacting the solid blades or channel walls and the material removal process. The computerized model is used to predict the quantity of material removed from the stationary and rotating blades of a turbomachine as well as the location of the erosion on the blades. This model is verified by testing a specially designed one and one-half stage test compressor and measuring the erosion. (Author)

N75-30564/9GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Life Analysis of Helical Gear Sets Using Lundberg-Palmgren Theory.
J. J. Coy, and E. V. Zaretsky. Aug 75, 34p NASA-TN-D-8045, E-8283
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Cleveland.

Descriptors: *Fatigue life, *Gears, *Mathematical models, Lubrication, Reliability engineering.

For abstract, see STAR 1321

N75-30568/0GA PC$9.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Mechanics of Machines.
I. I. Artobolevskiy. Aug 75, 303p NASA-TT-F-16568
Contract NASW-2483
Tran-Transl. Into English of the Book "Mekhanika Mashin" Moscow, Nauka Press, 1972 p 1-168.

Descriptors: *Gear teeth, *Machine tools, *Mechanical drives, Design analysis, Equipment specifications, Moments of inertia, Structural design criteria.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30571/4GA PC$4.25/MF$2.25
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
The Hydrodynamics of a Plug Bearing.
I. Etsion, and O. Pinkus. Jul 74, 62p TAE-217

Descriptors: *Gas bearings, *Hydrodynamic equations, *Incompressible fluids, Continuity equation, Numerical analysis, Plugs, Tables (Data).

For abstract, see STAR 1321

N75-30574/8GA PC$3.75/MF$2.25
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
A Non-Linear-Ph Method of Solution for Journal Gas Bearings.
M. J. Cohen. Nov 74, 31p TAE-234

Descriptors: *Fluid flow, *Gas bearings, *Journal bearings, *Nonlinear equations, Perturbation, Problem solving, Reynolds equation.

For abstract, see STAR 1321

N75-30575/5GA PC$3.25/MF$2.25
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
The Gas Plug Bearing.
I. Etsion, and O. Pinkus. Jul 74, 25p TAE-218

Descriptors: *Circular tubes, *Gas bearings, *Hydrodynamic equations, Differential equations, Frustums, Plugs, Pressure distribution, Tables (Data).

For abstract, see STAR 1321

PAT-APPL-476 821/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Reduced Shear Stress End Fitting.
Patent Application,
Frederick S. Hering, and Robert A. Ohlbaum.
Filed 6 Jun 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cables, *Cable assemblies, *Fittings, Patents, Shear stresses, Plugs, Taper.
Identifiers: *Hawsers, PAT-CL-52-230, *Patent applications.

The patent application relates to an end fitting for a hawser which reduces the shear stresses generated within the hawser. The hawser is embedded in a tapered plug, which fits within a complementary member which does not surround the tapered plug for its full axial length. As a result of this geometry, the shear stress which results from the combined tensile and compressive stresses within the hawser and plug is reduced thereby allowing a greater tensile load to be exerted upon the hawser.

PAT-APPL-576 941/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Eyeletting Attachment for Drill Presses.
Patent Application,
Leonard G. Terral, Ephrain Regelson, William E. Sake, Ronald J. Matusiak, and William L. Rea.
Filed 12 May 75, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Presses(Machinery), Patents, Drilling machines, Fittings, Attachment, Circuit boards, Electric connectors.
Identifiers: PAT-CL-339-176, *Patent applications.

The patent application relates to a conventional drill press provided with an eyeletting attachment to enable connector-type eyelets to be mounted in an electronic circuit board. The eyeletting attachment includes a pair of readily attachable tool holders; a movable upper holder attachable to the drill press quill, and a fixed lower tool holder attachable to the drill press stand, between which the workpiece is positioned and worked.

PATENT-3 899 224 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Lubricated Journal Bearing.
Patent.
F. T. Schuller, and W. A. Moore. Patented 12 Aug 75, 7p PAT-APPL-405 346
Misc-Filed 11 Oct. 1973 Supersedes N74-10475 (12 - 01, p 0060).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Journal bearings, *Mounting, *Pad, *Rotary stability, Gas bearings, *Patents, Pressure distribution, Shafts (Machine elements).
Identifiers: PAT-CL-308-121.

A plurality of bearing sectors are secured to a housing. Each sector comprises a pad mounted on a base. A stiff pad may be flexibly mounted while a flexible pad may be rigidly mounted.

13J. Marine Engineering

AD-A015 638/0GA PC$3.75/MF$2.25
Naval Ship Engineering Center Hyattsville Md Ship Concept Design Div
The Impact of Ship Design Margins.
Final rept. 1 May-1 Sep 75,
William A. Hockberger. 1 Sep 75, 44p Rept no. 6112-082-75

Descriptors: *Naval vessels, *Ship structural components, *Cost effectiveness, Cost analysis, Computer aided design, Base lines, Load control, Displacement, Cost benefits.
Identifiers: *Design margins, DD07 model.

The previously defined categories of Design and Construction Margins and Future Growth Margins are discussed briefly, and a third major category, Assurance Margins, is introduced and discussed in more detail. The feasibility of reducing margins to reduce ship size and cost is examined. Following a brief discussion of certain significant aspects of a version of the NAVSEC DD07 destroyer computer synthesis model and of the baseline ship used, the results of some computer studies of margin impacts are presented and interpreted. Changes in margins on space, weight, vertical center of gravity and power (propulsion and electrical) are investigated and their impacts expressed primarily as changes in full load displacement and in acquisition cost. The effects of combinations of margins are illustrated, and attempts are made to explain the mechanisms by which interactions occur.

AD-A015 817/0GA PC$8.75/MF$2.25
Wyle Labs Huntsville Ala
Standards Analysis Powering/Performance Evaluation Using Test Course Methods. Volume I. Research Report.
Final rept.,
R. W. White, J. O. Bowman, and S. L. Patrick. Mar 74, 285p Rept no. MSR-74-17-Vol-1 USCG-D-126-75
Contract DOT-CG-40672-A
See also Volume 2, AD-A015 818.

Descriptors: *Boats, *Horsepower, Coast Guard research, Safety, Hulls(Marine), Capacity(Quantity), Standards, Performance tests.
Identifiers: *Motor boats, *Outboard engines, DOT/4DZ/DD, Passengers.

Volume I contains the information gleaned from recent test programs conducted in the United States and Canada using various test courses to evaluate the performance of some 96 boats (less than 26 ft) in over 170 different boat/motor combinations. The report summarizes five different test programs, the tests performed, results of the tests and data obtained, and conclusions/recommendations based on the data/analysis reported. The test courses used were based upon those developed by ABYC/BIA and consist of a family of courses all of which have an entry gate and an offset (or avoidance) buoy. The course ends with an exit gate which is in-line with the entry gate. The entry/exit distances and offset distances are dependent on the boat maximum speed.

AD-A015 818/8GA PC$8.50/MF$2.25
Wyle Labs Huntsville Ala
Standards Analysis Powering/Performance Evaluation Using Test Course Methods. Volume II. Appendices A-G.
Final rept.,
R. W. White, J. O. Bowman, and S. L. Patrick. Mar 74, 272p Rept no. MSR-74-17-Vol-2 USCG-D-127-75
Contract DOT-CG-40672-A
See also Volume 1, AD-A015 817.

Descriptors: *Boats, *Horsepower, Coast Guard research, Safety, Hulls(Marine), Capacity(Quantity), Standards, Performance tests.
Identifiers: Passengers, *Motor boats, *Outboard engines, DOT/4DZ/DD.

This report consists of two volumes. Volume 2 contains Appendices A through G which consist of various relevant material and technical analysis conducted during the performance of the subject research. Research boats were instrumented (in some cases) to record, on analog tape, roll angle, pitch angle, heading (yaw), lateral acceleration and, to some extent, a prototype roll instability detector was used. Photographs of many of the test boats are included. The entire program was aimed at obtaining data/criteria for a 'performance' method of determining the maximum horsepower (speed) at which a small boat will not exhibit 'instability' when subjected to a severe maneuver, and to establish a reliable method to evaluate the results of tests.

AD-A015 821/2GA PC$5.75/MF$2.25
General Electric Co Arlington Va
Reliability Analysis of Vessel Steering System (Dual Electro-Hydraulic Type).
Final rept. 7 Jul 74-7 Jul 75,
Lewis M. Ewing, Carl M. Webster, and Clark L. Hackley. Jul 75, 139p Rept no. TR-958-198-111-1
Contract DOT-CG-43106-A

Descriptors: *Merchant vessels, *Steering, Hydraulic servomechanisms, Electrical equipment, Reliability, Accidents, Coast Guard research.
Identifiers: *Electrohydraulic systems, DOT/4DZ/DD.

Reliability engineering analysis and reviews are reported of a dual electro-hydraulic steering system for large commercial merchant vessels. Recommendations are given to aid Coast Guard Design review, vessel inspections, and accident investigations. An assessment of the study results is stated for applications of the reliability analysis procedures to navigation systems and other maneuvering systems. Conclusions include consideration of comments from contacts with Coast Guard marine inspectors, American Bureau of Shipping surveyors, ship yard supervisors, and ship owner port engineers and chief engineers. Summaries are stated from literature search and from study of vessel casualty reports and listings.

AD-A015 822/0GA PC$4.25/MF$2.25
Little (Arthur D) Inc Cambridge Mass
Design Criteria for Flame Control Devices for Cargo Venting Systems.
Final rept.,
R. P. Wilson, Jr., and S. Attalah. 1 Aug 75, 54p
USCG-D-157-75
Contract DOT-CG-42357-A

Descriptors: *Cargo ships, *Fuel tanks, *Venting, Flame arresters, Ship fires, Flames, Quenching(Inhibition), Coast Guard research.
Identifiers: DOT/4DZ/DD, DOT/5A.

Devices used to prevent flames from traveling into bulk cargo tanks through the venting system were studied, with emphasis on screens and arrestors for heat abstraction. The evidence indicates that low-speed flames can be quenched by an array of small passageways placed in the vent duct, provided the passageway diameter is less than 60 alpha/S, where alpha and S are the thermal diffusivity and laminar flame speed of the vapor/air mixture. Expressions are given for effective passageway diameter of flame screens, crimped ribbons, packed beds, and other common heat abstraction devices.

AD-A015 932/7GA PC$3.25/MF$2.25
Coast Guard Research and Development Center Groton Conn
A Census of Marine Traffic in a Selected Sector of the Gulf Coast ICW Derived from Side-Looking Airborne Radar Data.
Final rept.,
J. A. McIntosh, and L. D. Farmer. Mar 75, 18p
Rept no. CGR/DC-9/75 USCG-D-91-75

Descriptors: *Waterways, *Water traffic, Louisiana, Counting methods, Side looking radar, Airborne, Sampling, Data acquisition.
Identifiers: *Intracoastal waterways, *Gulf Coast(United States), DOT/4DZ/DD, DOT/5L.

A side-looking airborne radar was used to map selected portions of the Gulf Coast ICW from a point east of Houma, LA, to a point west of Intracoastal City, La, during the period 21 through 24 February 1975 for the purpose of sampling the number of vessels underway at any one time as functions of the time of day and of the sector of the area. An average of 70 vessels were observed in this area during this period.

AD-A015 950/9GA PC$4.25/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Experimental Performance of Some High-Pitch Cycloidal Propellers.
Final rept.,
M. C. Dickerson, and G. F. Dobay. Aug 70, 51p
Rept no. SPD-399-01

Descriptors: *Cycloidal propellers, Performance tests, Thrust, Propellers(Marine), Maneuverability, Steering, Pitch(Inclination), Angles, Propeller blades, High velocity, Torque.
Identifiers: *High pitch cycloidal propellers.

Open water test results of four high-pitch cycloidal propellers are reported herein. They were tested at various steering angles over a range of advance coefficients. The results show high thrust and maneuvering capability with these propellers at high advance - coefficients

indicating the potential for high-speed application of these propellers. (Author)

AD-A015 951/7GA PC$3.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Comparative Seakeeping Characteristics of Two United States Coast Guard Patrol Boats in Regular Waves.
Final rept.,
N. K. Bales. Sep 75, 32p Rept no. SPD-635-01

Descriptors: *Patrol craft, *Seakeeping, *Ocean waves, Sea states, Coast Guard, Ship hulls, Response, Comparison, Ship motion, Computer programs, Loads(Forces), Hydrostatic pressure.

The seakeeping characteristics of two, United States Coast Guard patrol boats (a 95-foot WPB and a 140-foot WAGB) are compared. The comparison is based on computer, nondimensional, responses in regular waves. On this basis, the seakeeping characteristics of the 95-foot boat are found to be superior to those of the 140-foot boat. (Author)

AD-A016 092/9GA PC$5.25/MF$2.25
Massachusetts Inst of Tech Cambridge Dept of Ocean Engineering
Documentation of Programs for the Analysis of Performance and Spindle Torque of Controllable Pitch Propellers.
Final rept.,
Shou-kuo Scott Tsao. May 75, 121p Rept no. 75-8
Contract N00014-67-A-0204

Descriptors: *Propellers(Marine), *Performance(Engineering), Geometry, Lifting surfaces, Wake, Pressure distribution, Numerical methods and procedures, Computer programming.
Identifiers: *Blade geometry, *Controllable pitch propeliers, Collocation method.

A numerical method for the analysis of controllable pitch propeller characteristics is presented. This inverse problem is complicated due to the unknown circulation distribution and the off-design blade geometry. Therefore, a normal mode collocation method is introduced which simplifies the problem by a combination of design approaches. Starting with the transformation of blade geometry resulting from rotation about the spindle axis, a numerical lifting-surface computation is then applied on the exact three-dimensional basis and solved for the amplitude of each mode by collocation in order to obtain the circulation distribution and the thrust and torque thereof. The work has been modified by a reconstructed vortex lattice distribution and the consideration of hub image and deformed wake effect so that the accuracy is improved.

AD-A016 240/4GA PC$5.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Seakeeping Trails of the BH.7 Hovercraft,
Allen H. Magnuson. Aug 75, 131p Rept no. SPD-574-01

Descriptors: *Amphibious operations, *Surface effect ships, *Seakeeping, Sea testing, Power spectra, Ocean waves, Height, Histograms.
Identifiers: BH 7 vessel.

Full-scale seakeeping trials of a 50-ton British hovercraft, the BH.7, were conducted off Cape Henry, Virginia in August 1973. Ship motions and wave height data were measured and recorded. The data was subsequently analyzed statistically. The craft, instrumentation systems and trials program are described and the results of the data analysis are presented and discussed. Response amplitude operators in pitch, heave and roll were computed from the power spectra and the results were interpreted using an equivalent damped oscillator model for pitch and heave motions.

AD-A016 241/2GA PC$3.25/MF$2.25
Navy Experimental Diving Unit Panama City Fla
Testing of Biomarine CCR 1000 Closed Circuit U.B.A.,
T. W. Cetta, and R. Radecki. Sep 75, 20p Rept no. NEDU-7-75

Descriptors: *Diver equipment, *Breathing apparatus, Performance(Engineering), Performance tests, Carbon dioxide, Scrubbers, Low temperature, Scuba diving.
Identifiers: *Closed circuit oxygen scuba, Underwater breathing equipment, Life support systems.

Breathing resistance and CO2 scrubber duration tests were performed. The maximum breathing resistance measured at 198 FSW during a breathing rate of 30 breaths per minute with a 2.0 Liter Tidal Volume breathing through a Mk VI mouth-piece was -15 centimeters of H2O during inhale and +14.5 centimeters of H2O during exhale. The CO2 scrubber duration was determined under three conditions at 200 FSW 32 degree F water with 0.85 SLPM CO2 add rate with a duration of 2 hours 40 minutes; 32 degree F water with a 1.2 SLPM CO2 add rate and a duration of 1 hour 57 minutes; and finally in 72 degree F H2O with a 0.85 SLPM CO2 add rate and a duration of 7 hours, 10 minutes.

NTIS/PS-75/763/3GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Marine Anchors (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Guy E. Habercom, Jr. Oct 75, 111p*
Supersedes NTIS/PS-75/014.

Descriptors: *Bibliographies, *Anchors(Structures), Anchoring, Moorings, Ocean bottom, Embedding, Cables(Ropes), Ocean currents, Abstracts.
Identifiers: *Anchors(Marine), *Explosive embedment anchors.

Marine anchors, their design, emplacement methods, and holding power are reviewed in these abstracts of Government-sponsored research reports. The hydrodynamics of anchor mooring systems is reviewed. (Contains 106 abstracts).

NTIS/PS-75/767/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Marine Propellers: Fluid Mechanics and Mechanical Properties (A Bibliography with Abstracts).
Rept. for 1964-Sep 75,
Guy E. Habercom, Jr. Oct 75, 150p*
See also NTIS/PS-75/768.

Descriptors: *Bibliographies, *Marine propellers, *Fluid mechanics, *Mechanical properties, Hydrodynamic configurations, Marine propeller noise, Vibration, Thrust, Fluid flow, Ship maneuvering, Hydrodynamics, Abstracts.

Marine propellers in various configurations are researched in these Government-sponsored research efforts. Mechanical properties, fluid dynamic and hydrodynamic properties, vibration, and propeller noise are among the parameters investigated. (Contains 145 abstracts) See NTIS/PS-75/768, Marine Propellers: Design and Fabrication and NTIS/PS-75/396, Cavitation, Pt. 5, Marine Propellers.

NTIS/PS-75/768/2GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Marine Propellers: Design and Fabrication (A Bibliography with Abstracts).
Rept. for 1964-Sep 75,
Guy E. Habercom, Jr. Oct 75, 97p*
See also NTIS/PS-75/767.

Descriptors: *Bibliographies, *Marine propellers, *Design, Hydrodynamic configurations, Cycloidal propellers, Shrouded propellers, Computer aided design, Propeller shafts, Fabrication, Counterrotating propellers, Abstracts.
Identifiers: *Highly skewed propellers, *Disc propellers.

The design and manufacturing techniques of marine propellers is researched in the Government-sponsored research reports. Ducted and cycloidal propellers are included in the investigations. (Contains 92 abstracts) See NTIS/PS-75/767, Marine Propellers: Fluid Mechanics and Mechanical Properties and NTIS/PS-75/296, Cavitation, Pt. 5, Marine Propellers.

PAT-APPL-426 783/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Shock Attenuating Structure.
Patent Application,
Kenneth W. Goben. Filed 20 Dec 73, 15p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ship structural components, *Shock absorbers, Patents, Underwater explosions, Shock resistance, Loads(Forces), Attenuators.
Identifiers: PAT-CL-188-1-C, *Patent applications.

The patent application relates to a shock attenuating support structure for equipment comprising metal material which exhibits 'elastic-plastic' properties. For all operational and low intensity shock loads, the structure acts in a rigid (or elastic) manner and transmits these forces without change to the structure or its mounted equipment. For high shock loads which would normally be damaging to the equipment, the structure deforms plastically and absorbs the excess acceleration and energy.

PAT-APPL-438 313/GA PC$3.75/MF$2.25
Department of the Navy Washington D C
Non-Polluting, Antifouling Composition and Method.
Patent Application,
Edward J. Dyckman, Jean A. Montemarano, Deborah M. Anderson, Eugene C. Fischer, and Robert R. Ressler. Filed 31 Jan 74, 48p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antifouling coatings, *Polymers, Tin compounds, Patents, Organometallic compounds, Water pollution, Abatement, Ships, Underwater structures, Biocides.
Identifiers: *Patent applications, *Tin organic compounds, PAT-CL-106-115, Water pollution control.

In this patent application objects which are designed to be submersed or submerged are rendered antifouling by using an organotin polymer wherein the tin is chemically combined in or bonded to the polymer. The polymer inhibits fouling of the exposed surface of the object while minimizing the effect on the surrounding environment due to reduced leaching of the organometallic compound from the polymer.

PAT-APPL-439 486/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Propellant-Actuated Deep Water Anchor.
Patent Application,
Robert J. Taylor, and Richard M. Beard. Filed 4 Feb 74, 16p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Anchors(Marine), *Embedding, Patents, Propellant actuated devices, Penetration, Firing circuits.
Identifiers: *Embedment anchors, PAT-CL-114-206, *Patent applications.

The patent application relates to a propellant-actuated direct embedment anchor which utilizes simplified structural shapes and provides a rapid keying feature which allows the most efficient use of penetration energy. The anchor system has two major parts; a launch vehicle and a projectile which includes a piston and fluke. Two different fluke designs are provided to satisfy the realm of anticipated seafloor conditions (sand, clay, and rock). The launch vehicle consists of a launching system, a reaction vessel and a firing mechanism.

PAT-APPL-446 062/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Method of Determining Watertight Integrity in Hovercraft.
Patent Application,
Barry Sharrow, Kirk C. Hoerman, and John W. Cauanaugh. Filed 6 Aug 74, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Air cushion vehicles, *Hulls, *Air pressure, Patents, Leakage(Fluid), Watertightness, Pressure gages.
Identifiers: PAT-CL-340-240, *Patent applications.

The patent application relates to a method of determining the watertight integrity of the floatation hull of air cushion vehicles, ground effect machines, and hovercraft by measuring the differential air pressure between the air pressure in the hull or individual airtight floatation compartments during operation of the vehicle and the air pressure in the static condition. Under normal operating conditions, the compartment air pressure-atmospheric pressure differential is the same as when the vehicle is static. If a leak occurs in the hull, the cushion air pressure, higher than atmospheric, will enter the hull or compartment causing therein a rise in pressure above atmospheric, detectable on differential pressure gauges. Continuous surveillance may be maintained by relaying the information to an annunciator or alarm system at a control station.

PAT-APPL-529 992/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Launching Means for Surface Effect Ships.
Patent Application,
Alan G. Ford. Filed 5 Dec 74, 14p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Surface effect ships, *Launching, *Recovery, Patents, Ramps, Hydraulic jacks.
Identifiers: PAT-CL-61-67, *Patent applications.

The patent application relates to a launching and recovering means for surface effect ships comprising an elevated ramp which extends into the water, and which is designed to be straddled by the surface effect ship. The width of the ramp matches the inside width of the contained pressure section of the surface effect ship; hydralic jacks or other extensible members support the surface effect ship at the upper end of the ramp.

PB-245 241/5GA PC$4.75/MF$2.25
New England River Basins Commission, Boston, Mass.
People and the Sound. Marine Transportation Planning Report.
Final rept.
Aug 75, 89p LISS-08
Report on Long Island Sound Study. Prepared in cooperation with Maritime Administration, Washington, D.C., and Department of Transportation, Washington, D.C. Prepared by Corps of Engineers, Waltham, Mass. New England Div.
Paper copy also available in set of 14 reports as PB-245 233-SET, PC$61.00.

Descriptors: *Marine transportation, *Regional planning, *Long Island Sound, Ports, Harbors, Conservation, Development, Water resources, New England, New York, Land development, Economic forecasting, Problem solving, Evaluation, Recommendations, Cargo transportation, Commerce.

A planning report describes the marine transportation element of the Long Island Sound regional study. It is part of the final report of the study, which outlines a strategy for securing the balanced conservation and development of natural resources of the Sound and its shoreline in both New York and Connecticut. The plan for Long Island Sound is an increment of the New England River Basins Commission comprehensive, coordinated joint plan for the water and related land resources of its region, which includes New England and the New York portions of Long Island Sound.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

N75-30591/2GA PC$74.50
Engineering Sciences Data Unit, London (England).
Flexibilities of and Stresses in Thin Pipe Bends under in-Plane Bending: Influence of Bend Angle and Tangent Pipe Ends.
Aug 75, 12p ESDU-75014
Subm-Sponsored by Roy. Aeron. Soc. And Inst. Of Mech. Engr.

Descriptors: *Bending moments, *Pipes (Tubes), *Stress analysis, Flexibility, Graphs (Charts), Mechanical properties, Thin walls.

For abstract, see STAR 1321

PAT-APPL-561 964/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
High Pressure, 4-Position, 5-Way, Pilot Operated Valve for Corrosive Media.
Patent Application,
William E. Schneider, and John A. Sasse. Filed 25 Mar 75, 14p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Underwater equipment, *High pressure valves, Patents, Hydraulic valves, Sea water, Ballast, Underwater vehicles.
Identifiers: *Patent applications, PAT-CL-251-63-5.

The patent application relates to a pilot hydraulic fluid pressure operated valve having the function of a 4-position 5-way valve for controlling the flow of high pressure corrosive media in a high pressure environment such as the deep ocean. The valve body contains two double-ended axially aligned poppet pistons each of which comprise a large pilot actuated piston in the center of the 'spool' and each of which have a valve poppet at each end of the 'spool' for control of the media which may be sea water ballast of a deep submergence vehicle for example.

13L. Safety Engineering

AD-A015 819/6GA PC$8.75/MF$2.25
Wyle Labs Huntsville Ala
Recreational Boat Safety Collision Research. Phase I. Volume I. Problems Definition.
Final rept. on Phase 1,
R. MacNeill, N. Momany, C. Stiehl, and G. Lancaster. Sep 75, 283p Rept no. MSR-74-20-Vol-1 USCG-D-143-75
Contract DOT-CG-40672-A
See also Volume 2, AD-A015 820.

Descriptors: *Boats, *Recreation, *Collisions, Safety, Data acquisition, Statistical distributions, Coast Guard research, Data processing, Human factors engineering, Sources, Variables, Classification, Computer applications, Surveys, Statistical data, Comparison, Collision avoidance.
Identifiers: *Recreational boating, DOT/2E, DOT/5A.

The conditions surrounding recreational boating collisions were probed in an attempt to obtain the information required to document probable causes and possible collision reduction techniques. Volume 1 contains problems definition. The document summarizes the results of work done to date as well as required additional efforts, as follows: Present collision investigation methodology, present collision data handling systems, present collision data coding methods, reports of collision investigations, data analysis and discussions, effects of stressors on human performance, effects of boat characteristics on human performance, human engineering principles applied to the control station, and education as a method of collision reduction.

AD-A015 820/4GA PC$4.75/MF$2.25
Wyle Labs Huntsville Ala
Recreational Boat Safety Collision Research. Phase I. Volume II. Collision Accident Investigations for 1974 Season.
Final rept. on Phase 1,
R. MacNeill. Sep 75, 78p Rept no. MSR-74-20-Vol-2 USCG-D-144-75
Contract DOT-CG-40672-A
See also Volume 1, AD-A015 819.

Descriptors: *Boats, *Recreation, *Collisions, Accidents, Surveys, Data acquisition, Reports, Factor analysis, Sources, Performance(Human), Damage, Wounds and injuries, Environments.
Identifiers: Accident investigations, DOT/2E, DOT/5A.

Volume Two of a two-part report on collision research in recreational boating gives the findings of accident investigations in boating for 1974. Six case studies, screened from 96 collisions, are discussed in detail.

AD-A015 884/0GA PC$3.75/MF$2.25
Coast Guard Research and Development Center Groton Conn
Obstructed Fire Tests on Hand-Held Fire Extinguishers for Recreational Boats.
Final rept.,
H. M. Hollingsworth. May 75, 26p Rept no. CGR/DC-17/75 USCG-D-133-75

Descriptors: *Fire extinguishers, *Boats, Recreation, Hand held, Sizes(Dimensions), Effectiveness, Operators(Personnel), Training, Chemicals, Gases, Marine engines.
Identifiers: *Recreation boats, Obstruction(General).

Tests were conducted to investigate the effect that an obstruction to direct access to a fire (such as the engine in a boat's engine compartment) might have on the effectiveness of extinguishing a fire with hand-held fire extin-

guishers. The tests were conducted by first determining what size obstructed fire could be extinguished by a trained operator and then by an untrained operator. It was found that an obstruction to direct access to the base of a fire has a significant impact on the effectiveness of some fire extinguishers. The effectiveness of chemical type extinguishers was more severely affected than gaseous types. (Author)

COM-75-50577/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
The NBS Program on Corridor Fires.
Final rept.,
F. C. W. Fung, M. R. Suchomel, and P. L. Oglesby. May 73, 8p
Pub. in Fire Jnl., v67 n3 p41-48 May 73.

Descriptors: *Fires, *Buildings, *Flame propagation, Energy, Mathematical models, Flammability, Floor coverings, Fire tests.
Identifiers: *Fire research, *Corridor fires.

This report outlines the NBS full scale experimental program to investigate the growth and spread of fire and smoke into and through a corridor when a fire is initiated in an adjoining room. The program proposes energy models to investigate both the contribution of the corridor interior finish surfaces and their interactions under the full scale fire situation. As a status report it describes in detail the experimental facilities and approaches for the program. A summary of the tests conducted to date is presented. Typical quantitative measurements of temperature, velocity, smoke and energy are presented. In addition, comparative discussions are presented for tests with and without forced air draft and carpet tests with and without underlayment.

PB-245 151/6GA PC$3.75/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
Fire Problems Program.
Annual summary rept. 1 Jul 70-30 Jun 71,
A. G. Schulz, and R. M. Fristrom. Aug 72, 49p
APL/JHU-FPP-A-72 NSF/RA/E-72-109
Grant NSF-GI-12

Descriptors: *Fire safety, *Project planning, Information systems, Fire prevention, Fire protection, Fire departments, Fire fighting, Public relations, Education, Problem solving, Technology, Engineering, Flames, Casualties, Research, Systems analysis.
Identifiers: Fire research.

The goal of the fire problems program is to realize improved fire protection for the nation through a systematic long-term effort in which relevant problems in science, engineering, and technology are studied and interpreted. The essential components of the program are a small group of scientists and engineers committed to the study of selected fire problems, specialists consulting with the nuclear group, and mechanisms for transmitting usable information to the fire community. This report summarizes progress made during the year in a number of areas: education and information, systems analysis and development, physical and chemical studies of fire and flame systems, medical and biochemical studies of fire deaths and casualties, and extramural technical fire-related activities.

PB-245 574/9GA PC$11.25/MF$2.25
AMF, Inc., Goleta, Calif. Advanced Systems Lab.
U.S. Research Safety Vehicle (RSV). Phase I Program. Volume II. Program Definition Foundation.
Final rept. Jan 74-Apr 75,
J. Andon, E. Dodson, A. Khadilkar, R. Olson, and L. Pauls. Jun 75, 432p* ASL-B31-Vol-2
DOT-HS-801 597
Contract DOT-HS-4-00841

See also Volume 1, PB-242 596.

Descriptors: *Motor vehicle accidents, *Automobiles, *Traffic safety, Motor vehicle operators, Statistical data, Forecasting, Planning, Classifications, Collision research, Social effect, Benefit cost analysis, Design criteria, Evaluation.
Identifiers: Research safety vehicles, DOT/4DZ/DB, DOT/5A.

Current passenger car usage patterns and factors influencing usage are analyzed and projections of usage patterns in the mid-1980's are made. Similarly, current available data on six categories of vehicle accidents are analyzed and projections made of national accident patterns in the mid-80's; the effect of potential reductions in these projections as a result of safety programs and other factors related to driving safety are estimated. Based on the usage and accident projections, the characteristics of an RSV (weighing under 3,000 lbs C.W.) for operation in the mid-1980 traffic environment are described.

13M. Structural Engineering

AD-A015 677/8GA PC$3.25/MF$2.25
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
Solution of St. Venant's Torsion Problem by Power Series.
Technical rept.,
R. D. Mindlin. Apr 74, 22p Rept no. TR-29
Contract N00014-67-A-0108-0027

Descriptors: *Structural members, *Power series, *Equations of motion, *Torsion, Approximation(Mathematics), Stresses, Vibration, Cross sections, Elastic properties.
Identifiers: *Saint venant principle, *Elastic bars.

It is shown how St. Venant's problem of torsion of elastic bars can be formulated so as to fit readily into the procedure for deriving approximate equations of motion of bars by expansion of the displacements in a double series of powers of the transverse coordinates. Applications are exhibited for bars with elliptic, equilateral triangular and rectangular cross-sections. (Author)

AD-A015 678/6GA PC$4.25/MF$2.25
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
Low Frequency Vibrations of Elastic Bars.
Technical rept.,
R. D. Mindlin. Apr 75, 69p Rept no. TR-30
Contract N00014-67-A-0108-0027

Descriptors: *Structural members, *Vibration, Elastic properties, Stress strain relations, Low frequency, Equations of motion, Power series, Mathematical prediction, Deformation, Torsion, Beams(Structural), Rods, Linear differential equations.
Identifiers: Elastic bars.

The method of expansion of three-dimensional displacements in a double power series of the transverse coordinates is employed to find one-dimensional equations applicable to low frequency vibrations of uniform, elastic, isotropic and anisotropic bars. The axial displacements accompanying torsion are chosen specially for each cross-sectional shape of bar--resulting in the correct, or nearly correct, torsional rigidity. Applications are to bars of elliptic, triangular and rectangular sections, illustrating various independent and coupled extensional, flexural and torsional modes of motion. (Author)

AD-A015 941/8GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
A Qualitative Appraisal of the Doubly Asymptotic Approximation for Transient Analysis of Submerged Structures Excited by Weak Shock Waves.
Final rept.,
H. Huang. Sep 75, 21p Rept no. NRL-MR-3135

Descriptors: *Underwater structures, *Vibration, Loads(Forces), Oscillation, Elastic properties, Shock waves, Transients.
Identifiers: *Dynamic structural analysis.

Using the problem of the transient response of a spherical elastic shell to the excitation of an incident plane step pressure wave as a test problem for the Doubly Asymptotic Approximation (DAA) method, a qualitative appraisal of this method is summarized as follows: (1) The DAA method, by the nature of its scheme is accurate for the prediction of early-time response; (2) If the intrinsic characteristic of the response of the submerged structure as manifested by its step response is of non-oscillatory nature or is dominated by non-oscillatory components, the DAA solution is not only accurate for late-time by design but also valid for intermediate-time responses; (3) If this intrinsic characteristic is of oscillatory nature or is dominated by oscillatory components, the DAA solution has faster oscillations (frequency distortion) and these oscillations are damped out much sooner than the real response. This indicates that the DAA formulation overestimates the fluid resistance to the structural oscillation; (4) The DAA solution underestimates the maximum oscillatory responses if they do not occur at early-time; (5) The DAA method is not useful for the prediction of the intermediate- and late-time oscillatory characteristics of the response, e.g., the structural vibration after the transit of the incident wave front; (6) Since (3) also represents an overstabilizing effect due to the fluid, the results will be doubtful if the DAA method is applied to analyze dynamic stability problems such as dynamic buckling of submerged shells and other nonlinear response problems.

AD-A016 026/7GA PC$3.25/MF$2.25
Research Triangle Inst Research Triangle Park N C Operations Analysis Dept
Rural Area Shelter Development Study.
Final rept. Jun 69-Jul 75,
M. D. Wright, E. L. Hill, D. F. Tolman, R. O. Lyday, and S. B. York, III. Jul 75, 61p Rept no. RTI-43U-464-3
Contract DAHC20-69-C-0400

Descriptors: *Fallout shelters, *Planning, Estimates, North Carolina, Georgia, Resources, Facilities, Methodology, Computer applications, Test methods, Field tests, Demography.
Identifiers: Counties.

This report describes the development and field testing of a procedure for estimating the total shelter potential by county in host areas defined for Crisis Relocation Plans (CRP). Shelter estimates are made by projecting population and construction data from the time of the last shelter survey in the county. The shelter yield expected to be found by an update of the various shelter survey programs is then estimated based on the projected construction activity. The procedure has been formulated into a computer program. Actual survey data for one North Carolina county and ten counties in Georgia were used as test cases of the methodology.

COM-75-11373/8GA PC$5.75/MF$2.25
National Bureau of Standards, Washington, D.C. Office of Building Standards and Codes Services.
Proceedings of the Annual Conference of the National Conference of States on Building Codes and Standards (7th) Held at Austin, Texas on April 28 - May 3, 1974.
Final rept.,

Sandra A. Berry. Sep 75, 133p* NBS-SP-429
Library of Congress Catalog Card no. 75-24777.

Descriptors: *Building codes, *Meetings, Design standards, Recommendations, Safety, Fires, Energy, Organizations, Evaluation, Management, Regulations, Technical reports.

The National Conference of States on Building Codes and Standards represents a response by the states to recommendations for intergovernmental reforms in the area of building codes. The Conference is structured to develop many technical and general recommendations in the field of comprehensive building code administration, and its programs explore the entire system of this important segment of governmental regulatory service.

PB-245 422/1GA PC$7.00/MF$2.25
Tetra Rech, Inc., Arlington, Va.
Energy Use in the Contract Construction Industry.
Final rept.
18 Feb 75, 185p* TETRAT-A-412-75-011-F
FEA/EI-1664
Contract DI-14-01-0001-1664
See also Appendix A, PB-245 423 and Appendix B, PB-245 424.

Descriptors: *Construction industry, *Energy consumption, *Fuel consumption, Diesel fuels, Gasoline, Lubricants, Petroleum products, Electricity, Asphalts, Residential buildings, Houses, Industrial buildings, Highways, Streets, Bridges(Structures), Waterworks, Sewer, Pipelines, Communication cables, Power distribution lines, Swimming pools, Fences, Air conditioning, Space heating, Plumbing, Painting, Carpentry, Roofing, Water wells, Demolition, Industries, Contractors.
Identifiers: *Electric power consumption, *Heat consumption, SIC 15, SIC 16, SIC 17, Fuel substitution, Energy conservation, Geographic divisions, Public utilities.

This report is an analysis of energy use in the contract construction industry compiled to determine the amount of energy used and the potential impact that national energy shortages would have on the industry. Analysis includes building construction, heavy construction, and special trades. The overview is composed of a discussion of the industry structure, energy use, intraindustry variations, energy supply, and substitutability and conservation of fuels. Contractors in the following industries are analyzed: Single-family housing; residential building; industrial building; nonresidential construction; highway and street; bridge, tunnel, and elevated-highway; waterworks, sewer, pipeline, communication line, and power line; heavy construction, swimming pool and fence; and special trades.

PB-245 423/9GA PC$7.00/MF$2.25
Tetra Tech, Inc., Arlington, Va.
Energy Use in the Contract Construction Industry. Appendix A. Study Methodology.
18 Feb 75, 179p* TETRAT-A-412-75-011-APP-A
FEA/EI-1664-A
Contract DI-14-01-0001-1664
See also Appendix B, PB-245 424 and Final rept., PB-245 422.

Descriptors: *Construction industry, *Energy consumption, *Fuel consumption, Construction equipment, Diesel fuels, Gasoline, Electricity, Petroleum products, Residential buildings, Industrial buildings, Commercial buildings, School buildings, Hospitals, Farm building, Public utilities, Highways, Streets, Waterworks, Sewers, Swimming pools, Bridges, Pipelines, Tunnels, Power distribution lines, Cost analysis, Data, Computer programs, Cost indexes, Industries.
Identifiers: *Electric power consumption, *Heat consumption, SIC 15, SIC 16, SIC 17, Geographic divisions.

This report contains data describing the activity of the contract construction industry expressed in terms of the dollar value of construction. A prime requirement of the methodology employed was the development of a traceable relationship between the dollar value of construction activity and the type of construction, geographical area of construction, and the energy consumed during construction. The basic methodology used to estimate fuel and energy use for representative construction projects involved the following: postulating representative construction projects of at least three sizes for each division of the industry; identifying energy-consuming equipment required for each project and determining fuel and energy consumption rates for each equipment type; estimating hours of operation for each type of equipment; and estimating fuel and energy use for each project by combining the results of the above two steps. Portions of this document are not fully legible.

PB-245 424/7GA PC$7.25/MF$2.25
Tetra Tech., Inc., Arlington, Va.
Energy Use in the Contract Construction Industry. Appendix B. Assessment of Construction Equipment Availability, Energy Requirements, and Construction Industry Capacity to Support Project Independence.
18 Feb 75, 201p* TETRAT-A-412-75-011-APP-B
FEA/EI-1664-B
Contract DI-14-01-0001-1664
Prepared by Parsons (Ralph M.), Co., Washington, D.C. See also Appendix A, PB-245 423 and Final rept., PB-245 422.

Descriptors: *Construction industry, *Construction equipment, *Fuel consumption, Electric power plants, Refineries, Facilities, Access roads, Buildings, Construction, Diesel fuels, Gasoline, Energy requirements, Coal mines, Shales, Coal gasification, Coal liquefaction, Nuclear power plants, Oil wells, Gas wells, Geothermal systems, Energy conversion.
Identifiers: *Project Independence, Biological energy conversion.

The report discusses various sources of energy and energy-producing processes, necessary construction equipment used in these processes, hours required for operating the equipment, and estimated energy consumed by the construction equipment; availability of necessary construction equipment; impact of equipment availability on the nation's capability to expand the output of energy-producing facilities; and capability of the construction industry to support Project Independence. Portions of this document are not fully legible.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A015 623/2GA PC$3.25/MF$2.25
Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
Test Techniques for High-Lift, Two-Dimensional Airfoils with Boundary Layer and Circulation Control for Application to Rotary Wing Aircraft.
Final rept.,
R. J. Englar, and R. M. Williams. Jul 75, 21p
Rept no. Aero-1205 NSRDC-4645

Descriptors: *Rotary wings, *Test methods, Experimental design, High lift, Technology, Boundary layer control, Circulation, Walls, Jets, Airfoils, Measurement, Flow separation, Two dimensional flow.
Identifiers: Blowing, Circulation control, Wall interference.

Extensive testing experience with very high lift mono-element blown airfoils to be employed by rotary wing aircraft has necessitated the development of unconventional two-dimensional test techniques. Both experimental and analytical results are presented which should assist future investigators in conducting similar tests accurately. The primary problem of high lift two-dimensional testing, wall boundary layer separation due to severe adverse pressure gradients on the model, is discussed as are the serious errors introduced by this phenomenon. A detailed discussion is presented concerning the additional considerations which must be given to blown airfoil testing. Such additional test problems as wall and blockage corrections, Reynolds number effects, leading edge separation, and flow visualization are addressed.

AD-A015 796/6GA PC$3.75/MF$2.25
Washington Univ Seattle Aerospace Research Lab
Laser Heating for High Enthalpy Aerodynamic Test Facilities.
Final technical rept. 1971-Jun 74,
William G. Beverly, George C. Vlases, and Abraham Hertzberg. Jun 75, 29p ARL-75-0179
Contract F33615-71-C-1914
See also report dated Apr 74, AD-783 208.

Descriptors: *Hypersonic wind tunnels, *Heating elements, Carbon dioxide lasers, Feasibility studies, Enthalpy, Atmosphere entry, Simulation, High temperature, Time, Flow fields, Test facilities.
Identifiers: *Laser heating.

A feasibility study has been made of the 'laser heated wind tunnel'. The analytical portion of the study indicates that it should be possible to achieve stagnation conditions of 10,000 degrees Kelvin and 1-2,000 atmosphere with laser powers of a few megawatts. Heat transfer at the throat is large, and will limit run time. An expreimental program initiated to study breakdown at high pressures, was of limited success due to state-of-the-art limitations on high power infrared window design. These limitations currently constitute the major unknown in assessing the ultimate success of the LHWT concept.

AD-A015 807/1GA PC$17.25/MF$2.25
Braddock Dunn and Mcdonald Inc Vienna Va
Operational Test Instrumentation Guide. Volume II. U.S. Army Test Facilities.
Jan 74, 765p
Contract DAAG39-73-C-0130
Supersedes AD-776 287. See also Volume 1, AD-776 286.

Descriptors: *Test facilities, *Instrumentation, Army, Army equipment, Logistics, Data processing, Test equipment.

The United States Army Operational Test and Evaluation Agency (USAOTEA) Instrumentation Guide presents, in three volumes, the results of an operational test-oriented survey of some thirty-three Department of Defense test/training facilities. In addition to the available instrumentation, detailed information is provided on the landspace, airspace, data reduction, and other general support capabilities of each installation. The general support area includes such information as: (a) type, location, size, and commitments of nearby military units: (b) facility access; (c) maintenance and logistics capability; (d) climate and topography; and (e) power/communications availability. Test support equipment mobility is addressed throughout the guide to indicate its flexibility for use. Volume II contains annexes addressing the capabilities of U.S. Army facilities and Volume III presents information for the non-Army DOD facilities.

AD-A015 976/4GA PC$5.25/MF$2.25
TRW Systems Group Redondo Beach Calif
Laser Holography to Visualize Low Speed Aerodynamic Flow Phenomena.
Final rept. 2 Jul 73-28 Feb 74,
R. A. Briones, D. E. Haflinger, C. W. Lear, B. J. Matthews, and A. B. Witte. Aug 74, 111p Rept no. TRW-24969-6002-RU-00
Contract N00019-73-C-0536

Descriptors: *Flow visualization, *Holography, Ruby lasers, Aerodynamics, Feasibility studies, Flow fields, Methodology, Bubbles, Interferometry, Smoke, Photographic recording systems, Wind tunnel tests, Low velocity.

The feasibility of using laser holography as a means of visualizing an aerodynamic flow field in three dimensions has been studied. The versatility of laser holography as a high speed recording system for a three-dimensional image, or a volume of information, is discussed. The three holographic techniques found to be most viable were neutrally buoyant bubble injection, helium interferometry, and smoke injection. Bubble injection uses double exposure holography to obtain both streamline directions and a velocity field. A complete flow field map is obtained statistically. Helium interferometry proved capable of showing up local, qualitative flow features. Smoke injection possesses the same advantage as the classical smoke techniques, but requires larger smoke densities.

AD-A016 029/1GA PC$3.75/MF$2.25
Calspan Corp Buffalo N Y
Self-Correcting Wind Tunnels - Concept and Demonstration (Two Reprints).
Technical rept.,
W. R. Sears, R. J. Vidal, J. C. Erickson, Jr., and P. A. Catlin. Oct 75, 30p Rept no. CALSPAN-RK-5070-A-4
Contract N00014-72-C-0102

Descriptors: *Transonic wind tunnels, *Fluid dynamics, Errors, Walls, Corrections, Test facilities, Flow fields, Mathematical models, Feasibility studies, Control systems, Interference, Reprints.
Identifiers: Wall interference.

This report consists of two reprints, 'Self-Correcting Wind Tunnels' by W. R. Sears published in The Aeronautical Journal, Vol. 78, No. 758/759, February/March 1974, pp. 80-89, and 'Experiments with a Self-Correcting Wind Tunnel' by R. J. Vidal, J. C. Erickson, Jr. and P. A. Catlin presented at the 'Symposium on Wind Tunnel Design and Testing Techniques' organized by the AGARD Fluid Dynamics Panel in London on 6-8 October 1975.

AD-A016 089/5GA PC$3.75/MF$2.25
Royal Aircraft Establishment Farnborough (England)
A Rotary Vibrator for the Calibration of Angular Motion Transducers.
Technical memo.,
J. S. Whitall. Apr 75, 29p Rept no. RAE-TM-IT-153 DRIC-BR-47818

Descriptors: *Transducers, *Calibration, *Vibrators(Electrical), Servoamplifiers, Oscillation, Vibration, Servomechanisms, Great Britain.

A rotary vibrator developed for the calibration of angular displacement, velocity and acceleration transducers is described. The design is based on a standard printed circuit motor which is driven by a servo-amplifier to give rotary oscillations of approximately constant peak amplitude, constant peak velocity or constant peak acceleration at choice as the frequency is varied.

AD-A016 115/8GA PC$3.75/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
Wind Tunnel Data Acquisition Procedures.
Final rept.,
Lyle D. Kayser. Aug 75, 31p Rept no. BRL-MR-2515

Descriptors: *Wind tunnels, *Recording systems, *Data acquisition, Analog systems, Digital systems, Amplifiers, Switches, Manuals.
Identifiers: *High speed recording.

The procedures for acquiring data with the Astrodata system are explained in this report. These procedures are compatible with the standard wind tunnel data reduction program. Also included is a brief generalized description of the data acquisition system functions and some examples of unprocessed data which should help to clarify the procedures. This report is intended to aid operational personnel, program engineers, and users of the wind tunnel in obtaining data in an orderly and efficient manner.

AD-A016 138/0GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Adherence of Roadways and Anti-Skid Qualities of Tires,
Y. Tcheng, and R. Mascherczyk. 24 Apr 75, 19p Rept no. FTD-HC-23-1137-75
Edited trans. of Revue Generale des Matieres Plastiques (France) v49 n10 p895-899 1972.

Descriptors: *Tires, *Test equipment, Skidding, Sliding, Test methods, Variations, Pavements, Braking, Friction, Water flow, Surface roughness, Rubber, Loads(Forces), Translations, France.
Identifiers: Stradographs.

A new stradograph was designed so that the sliding rate of wheels can be varied between 0 and 100%. A detailed description is given: vertical suspension and loading, recording, measurement units, determination of the transverse force and longitudinal force, sprinkling device, measurement wheel. Then a description is given of the operations carried out during a test, depending on the type of friction one wishes to investigate. This apparatus can measure a large number of useful parameters, both for tire construction engineers and for roadway builders.

AD-A016 142/2GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Angular Movement Pick-Up,
A. V. Anikin, L. A. Bubnov, Yu. N. Kuroedov, S. N. Orekhov, and N. A. Rantsev. 7 May 75, 8p Rept no. FTD-ID(RS)I-1298-75
Edited trans. of Patent (USSR) 339 932 p1-2 23 May 63, by Carol S. Nack.

Descriptors: *Magnetic detectors, Angles, Motion, Magnetic fields, Flux(Rate), Translations, Patents, USSR.

The device is related to automatic control and regulation systems. Angular movement pick-ups that contain a windingless geared rotor, mobile and immobile geared stators, measuring windings, annular magnets and a reversible motor for independent electric drive are well-known. The device described is different because the geared rotor in it is hollow and is rigidly attached to the reversible electric motor's rotor to whose stator the pick-up's immobile stator is rigidly attached, the annular magnets and measuring windings being located in the circular grooves of magnetic disks fastened to the immobile shaft that passes through the pick-up's center. This design of the device made it possible to increase the output voltage amplitude and, consequently, also the accuracy of its operation.

AD-A016 145/5GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Interference Method of Measuring Values of Linear and Angular Displacements,
V. I. Teleshevskii. 6 May 75, 10p Rept no. FTD-ID(RS)I-1329-75
Edited trans. of Patent (USSR) 408 145 4p 10 Dec 73, by Carol S. Nack.

Descriptors: *Interferometers, Acoustooptics, Displacement, Measurement, Lasers, Monochromatic light, Translations, Patents, USSR.

The invention is related to the field of measuring technology, in particular to methods of constructing photoelectric interferometers intended for measuring values of linear and angular displacements in the mobile units of precision metal-cutting machines, measuring instruments and automatic control computers, systems and equipment.

AD-A016 154/7GA PC$3.25/MF$2.25
Army Test and Evaluation Command Aberdeen Proving Ground Md
U. S. Army Test and Evaluation Command Development Test II (EP) - Common Test Operations Procedures 'Center of Gravity'.
Final rept. on test operations procedure.
16 Jul 74, 13p Rept no. TOP-2-2-800

Descriptors: *Military vehicles, *Center of gravity, *Test methods, Suspending(Hanging), Reaction kinetics, Weight, Military equipment, Load distribution.
Identifiers: *Common engineering test procedures.

The report describes standard techniques for determining the center of gravity of heavy equipment including vehicles and large weapons. It covers suspension, reaction, and weighing methods. It includes procedures for calculating the combined center of gravity of two or more masses when attached to each other and considered a single unit. It discusses error factors and factors to be considered in selecting the appropriate method. The test methods apply to wheeled and tracked vehicles, trailers, large weapons, construction equipment, and certain types of warehouse and shop equipment.

BM-RI-8038 PC$4.00/MF$2.25
Bureau of Mines, Morgantown, W.Va. Morgantown Energy Research Center.
Precision Tests on Neutron Sulfur Meter in Coal Preparation Plant.
A. W. Hall, J. W. Martin, R. F. Stewart, and A. M. Poston. 1975, 15p

Descriptors: (*Sulfur, *Nuclear reaction analysis), (*Coal, Nuclear reaction analysis), Californium 252, Neutron sources, Thermal neutrons.

For abstract, see NSA 32 08, number 19822.

COM-75-50558/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
The Utilization of Solid Objects as Reference Standards in Density Measurements.
Final rept.,
H. A. Bowman, R. M. Schoonover, and C. L. Carroll. 1974, 5p
Pub. in Metrologia, v10 p117-121 1974.

Descriptors: *Silicon, *Density(Mass/volume), *Standards, Measurement, Tests, Calibrating.
Identifiers: Reprints.

NBS has measured the densities of four single crystal silicon objects to a standard deviation of 0.26 ppm with a systematic error of 0.7 ppm. These objects will be used as working stan-

dards to which density work in the United States will be referred. A redundant hydrostatic comparison test involving two standards at a time has been devised, the use of which facilitates the efficient propagation of the density information contained in these crystals into other objects which may be used as standards by other laboratories. This article describes a method of employing this redundant comparison procedure.

COM-75-50592/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Specimen Preparation, Special Techniques, and Applications of the Scanning Electron Microscope.
Final rept.,
D. E. Newbury, and H. Yakowitz. 1975, 52p
Pub. in Practical Scanning Electron Microscopy, p211-262 1975.

Descriptors: *Electron microscopy, Materials, Surface finishing, Stroboscopes.
Identifiers: Reprints, *Scanning electron microscopy.

Techniques of specimen preparation for scanning electron microscopy, including degreasing, electropolishing, and deposition of conductive coatings, are discussed. Stereomicroscopy, the technique of obtaining images with depth information, is described. Dynamic experiments conducted in situ in the scanning electron microscope (SEM) are considered. Examples of dynamic experiments, including tensile straining and the application of magnetic fields, are given. Stroboscopy, the imaging of high frequency, cyclical events is described. Practical applications of the SEM to a range of materials science problems are described in detail.

COM-75-50593/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Methods of Quantitative X-Ray Analysis Used in Electron Probe Microanalysis and Scanning Electron Microscopy.
Final rept.,
Harvey Yakowitz. 1975, 46p
Pub. in Practical Scanning Electron Microscopy, New York, 1975 p327-372.

Descriptors: *Electron microscopy, Electron probes, X ray analysis, Microanalysis, Quantitative analysis, Iron alloys, Silicon alloys.
Identifiers: *Electron probe microanalysis, Reprints, *Microprobe analysis, *Scanning electron microscopy.

Quantitative microprobe analysis is considered from the classical point of view as well as the so-called empirical approach. The relations used to convert raw data to mass fractions are discussed and scrutinized with respect to sources of error in the final analysis. Histograms depicting the typical spread of results are used to show what can be expected. By way of illustration, the complete planning and execution of the analysis of binary silicon-iron alloy is described in detail. Brief mention is made of special specimen geometries such as thin films or fracture surfaces and means to obtain analyses from them. An extensive reference list is appended.

COM-75-50594/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Practical Aspects of X-Ray Microanalysis.
Final rept.,
Harvey Yakowitz. 1975, 34p
Pub. in Practical Scanning Electron Microscopy, New York, 1975 p401-434.

Descriptors: *Electron microscopy, Electron probes, Microanalysis, X ray analysis, Quantitative analysis, Materials.
Identifiers: Microprobe analysis, Reprints, Scanning electron microscopy, *Electron probe microanalysis.

Element identification and distribution as determined by electron probe microanalytical techniques is explained. Both energy dispersive systems and curved crystal spectrometers are considered from the point of view of ease and accuracy of identification and distribution determination. A series of examples including minerals, meteorites, composite materials, superalloys and tool steel is discussed in terms of solution of practical problems by elemental identification and distribution. For accurate quantitative electron probe microanalysis, specimen preparation plays a crucial role. Therefore, effects of specimen preparation are evaluated in terms of surface roughness, instrumental design and nature of the specimen. The role of standards in the analysis is outlined. Finally a series of examples involving compositional analysis is presented.

COM-75-50595/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Computational Schemes for Quantitative X-Ray Analysis: On-Line Analysis with Small Computers.
Final rept.,
Harvey Yakowitz. 1975, 28p
Pub. in Practical Scanning Electron Microscopy, New York, 1975 p373-400.

Descriptors: *Electron microscopy, Electron probes, Microanalysis, X ray analysis, Quantitative analysis.
Identifiers: Reprints, Microprobe analysis, Minicomputers, Scanning electron microscopy, On line systems, *Electron probe microanalysis.

This chapter deals with rapid means to perform data reduction for quantitative electron probe microanalysis with the aid of small computational devices (desk calculator to 8K machine). Included will be a complete discussion of a ZAF program packaged for on-line data reduction and the basis for use of the hyperbolic approximation on-line. For the laboratory which only does occasional quantitative analysis, a brief discussion is given of how to obtain an analysis with a desk calculator in a reasonable time -- about two hours for a six component system or 30 minutes for a binary starting from scratch is needed. Solved examples are included.

COM-75-50596/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Introduction to Practical Scanning Electron Microscopy.
Final rept.,
J. I. Goldstein, H. Yakowitz, and D. E. Newbury. 1975, 19p
Pub. in Practical Scanning Electron Microscopy, New York, 1975 p1-19.

Descriptors: *Electron microscopy, Optical equipment, Signal processing, Images, Instrumentation, Electron probes.
Identifiers: *Scanning electron microscopes, Reprints, Image processing, Optical images, *Electron probe microanalysis.

This chapter traces the evolution of the scanning electron microscope and the electron probe microanalyzer from birth to the present. A number of major developments both instrumental and methodological are outlined. The purpose is to familiarize the novice with these developments; for the experienced SEM user, the chapter aim is to remind one of the significant stages of instrumental development. Points touched upon include the discovery and exploitation of various SEM contrast mechanisms such as topographic, voltage and magnetic contrast as well as stages in the development of signal and image processing.

COM-75-50597/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Image Formation in the Scanning Electron Microscope.
Final rept.,
Dale E. Newbury. 1975, 54p
Pub. in Practical Scanning Electron Microscopy, New York, 1975, p95-148.

Descriptors: *Electron microscopy, *Images, Optical equipment, Optical detectors, Contrast.
Identifiers: Reprints, *Scanning electron microscopy, Image processing, Optical images.

Various types of signal detectors are described: the Everhart-Thornley detector for back-scattered and secondary electrons, the solid state detector for backscattered electrons, specimen (absorbed) current detection, x-ray detectors, and cathodoluminescence detectors. Contrast formation is explained. The relationship between the image quality and the characteristics of the signal is detailed.

COM-75-50598/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Contrast Mechanisms of Special Interest in Materials Science.
Final rept.,
D. E. Newbury, and H. Yakowitz. 1975, 62p
Pub. in Practical Scanning Electron Microscopy, New York, 1975, p149-210.

Descriptors: *Electron microscopy, Images, Contrast, Electron beams, Magnetic fields, Electric potential, Crystal structure, Cathodoluminescence.
Identifiers: *Scanning electron microscopy, Image processing, Optical images, Reprints.

This chapter considers several mechanisms of contrast formation in the scanning electron microscope (SEM). The physical origin of each mechanism is considered in detail. Electron channeling contrast results from effects of the periodic arrangement of atoms in a crystal on the penetration of the incident electrons. Type I magnetic contrast arises from effects of leakage fields outside the specimen on emitted secondary electrons. Type II magnetic contrast is related to effects of the internal magnetic field on the primary electrons as they undergo scattering in the specimen. Voltage contrast arises from the effect of surface potentials on the collection of emitted secondary electrons. Electron beam induced conductivity contrast (EBIC) occurs in certain semiconductors through the formation of electron-hole pairs, locally changing the conductivity from the interaction of the primary electrons. Cathodoluminescence results due to the emission of visible light when electron-hole pairs recombine.

NTIS/PS-75/765/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Frequency Standards (A Bibliography with Abstracts).
Rept. for 1964-Sep 75,
George W. Reimherr. Oct 75, 141p*

Descriptors: *Frequency standards, *Bibliographies, *Time standards, *Atomic clocks, Time signals, Cavity resonators, Frequency stability, Cesium frequency standards, Radio broadcasting, Time measurement, Crystal oscillators, Rubidium frequency standards, Quartz resonators, Masers, Television broadcasting, Calibrating, Abstracts.

The design, performance, calibration, limitations, and theory of various frequency standards are discussed in the cited reports. Topics covered also include time standards, atomic clocks, and radio broadcasting of standard frequency and time signals. (Contains 136 abstracts)

N75-30199/4GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Shake Test of Rotor Test Apparatus with Balance Dampers in the 40 by 80 Foot Wind Tunnel.
W. Johnson, and J. G. Biggers. Jul 75, 37p NASA-TM-X-62470, A-6229
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Rotors, *Vibration tests, *Viscous damping, *Wind tunnel tests, Dynamic characteristics, Performance tests, Resonant frequencies, Tables (Data), Transfer functions.

For abstract, see STAR 1321

N75-30202/6GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Description and Initial Operating Performance of the Langley 6-Inch Expansion Tube Using Heated Helium Driver Gas.
J. A. Moore. Sep 75, 41p NASA-TM-X-3240, L-9900

Descriptors: *Gas expansion, *Helium, *Shock tubes, *Test facilities, Hypersonic flow, Shock waves.

For abstract, see STAR 1321

N75-30376/8GA PC$3.25/MF$2.25
Arizona Univ., Tucson. Optical Sciences Center.
Measurement of Dimensional Stability.
Final Report, 6 Jun. 1972 - 5 Jun. 1975.
S. F. Jacobs, J. W. Berthold, Iii, and M. Norton. Jul 75, 24p NASA-CR-143931
Contract NAS8-28661

Descriptors: *Dimensional stability, *Silicates, Dimensional measurement, Silicon dioxide, Titanium compounds.

For abstract, see STAR 1321

N75-30509/4GA PC$4.25/MF$2.25
California Univ., Los Angeles. Dept. of Meteorology.
The Polarimeter and the Multispectral Radiometer as Remote Probes of Aerosols.
Final Technical Report, 1 Sep. 1974 - 1 Sep. 1975.
J. G. Kuriyan. 1 Jan 75, 71p NASA-CR-143333
Grant NSG-1106

Descriptors: *Aerosols, *Instrument errors, *Meteorological parameters, *Polarimeters, *Radiometers, Atmospheric composition, Graphs (Charts), Remote sensors.

For abstract, see STAR 1321

N75-30513/6GA PC$4.25/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
Dynamic Testing of the Kearfott 2401 Accelerometer.
Final Report.
B. Katz. Jun 75, 52p NASA-CR-143929, R-890
Contract NAS8-30255

Descriptors: *Accelerometers, *Dynamic tests, *Servomechanisms, Error analysis, Moments of inertia, Numerical analysis, Torque.

For abstract, see STAR 1321

N75-30514/4GA PC$3.25/MF$2.25
Council for Scientific and Industrial Research, Pretoria (South Africa).
An Automatic Continuous Flow Ultramicroscopic Analyzer for Quantitative and Dimensional Determinators of Particles Suspended in Liquid Media.
E. I. Akopov, M. A. Karabegov, and A. G. Ovanesjan. 1974, 7p CSIR-REF-1156
Tran-Transl. into English from Prib. Sist. Upr. (Moscow), No. 5, 1973 p 42-43.

Descriptors: *Continuum flow, *Liquid flow, *Particle size distribution, *Quantitative analysis, *Suspending (Mixing), Chemical analysis, Equipment specifications, Performance prediction.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30606/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Monitoring Crack Extension in Fracture Toughness Tests by Ultrasonics.
S. J. Klima, D. M. Fisher, and R. J. Buzzard. 1975, 28p NASA-TM-X-71754, E-8395
Conf-Proposed for Presentation at Natl. Fall Conf. Of the AM. Soc. For Nondestructive Testing, Atlanta, 13-16 Oct. 1975.

Descriptors: *Crack initiation, *Fracture strength, *Ultrasonic tests, Annealing, Crack propagation, Fatigue tests, Maraging steels.

For abstract, see STAR 1321

N75-30632/4GA PC$9.25/MF$2.25
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
Geometric Analysis and Restitution of Digital Multispectral Scanner Data Arrays.
J. R. Baker, and E. M. Mikhail. 1975, 308p NASA-CR-144398, LARS-052875
Contracts NAS9-14016, NGL-15-005-112

Descriptors: *Digital data, *Error analysis, *Multispectral band scanners, Algorithms, Arrays, Collinearity, Parameterization, Remote sensors, Transformations (Mathematics).

For abstract, see STAR 1321

N75-30878/3GA PC$5.25
Paris-Sud Univ., Orsay (France). Lab. d'Optique Coherente.
Very High Luminosity Holographical Spectrograph Using Fourier Transform Etude d'UN Spectrograph Par Transformation de Fourier a Tres Haute Luminosite Basee sur l'Holographie.
Final Report.
Feb 73, 123p
Contract DGRST-70-02-260
Language in French.

Descriptors: *Fourier transformation, *Holographic interferometry, *Signal to noise ratios, *Spectrometers, Data processing, Emission spectra, Michelson interferometers, Modulation transfer function, Spatial filtering, Spectrum analysis.

For abstract, see STAR 1321

PAT-APPL-420 829/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
An Acoustic Device for Measuring Rotation Rates.
Patent Application,
Herbert G. Shaw. Filed 3 Dec 73, 8p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Acoustic detectors, Patents, Acoustic measurement, Rotation, Rates, Velocity, Transducers, Angular motion.
Identifiers: *Patent applications, PAT-CL-73-205.

The patent describes an acoustic sensing device for measuring the angular velocity of a spherical body; preferably comprised of at least one input transducer and at least one output transducer. The acoustic wave column traverses the periphery of the spherical body from the input transducer to the output transducer when the spherical body is rotated. The rate of rotation is determined by the output signal received by the output transducer.

PAT-APPL-444 576/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Leakage Test Method and Apparatus.
Patent Application,
Terry M. Dolan, and Michael G. Leedy. Filed 21 Feb 74, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Compressed air, *Leak detectors, Patents, Leakage(Fluid), Pressure gages, Flow rate.
Identifiers: *Patent applications, PAT-CL-73-40.

The patent application relates to a method and apparatus for determining the quantity of compressed gas that is escaping from an enclosed volume. A sample of the gas at the enclosed volume pressure is taken from the enclosed volume. The sample is applied to one side of a differential pressure gage. The gas of the enclosed volume is then connected to the other side of the differential pressure gage and to a gas source that is maintained at a pressure greater than the pressure of the enclosed volume. Gas is added from the gas source to the enclosed volume to maintain a zero differential pressure on the differential pressure gage. The flow rate of the gas from the gas source is measured over a relatively short period of time which indicates the leakage of the enclosed volume.

PAT-APPL-470 877/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
A.D.C. Operated Ground Fault Locator for Energized Shipboard A.C. Electrical Systems.
Patent Application,
Ernest W. Fisher. Filed 17 May 74, 17p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Test equipment, Patents, Faults, Detectors, Ground(Electrical), Shipboard, Electric power.
Identifiers: *Electrical fault location, *Patent applications, PAT-CL-317-18-D.

The patent application describes a device for locating a ground fault in an energized shipboard or other A.C. electrical power system which is normally not grounded. A direct current power supply is used to inject direct current into one of the power lines of the A.C. system. A Hall sensor is placed in proximity to the outer surface of the cable under test. A center zero D.C. meter monitors the Hall output. Any meter deflection indicates a resistive ground. The fault may then be located by properly maneuvering the Hall sensor and observing where the meter deflection reverses.

PAT-APPL-482 979/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Holographic Interferometry Apparatus and Method of Measuring Deflections of Dynamic Bodies.
Patent Application,
Jerome P. Sikora, and Frederic T. Mendenhall, Jr. Filed 25 Jun 74, 18p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Holography, *Interferometry, Patents, Pulsed lasers, Optical equipment, Mirrors.
Identifiers: *Patent applications, *Interferometric holography, PAT-CL-356-109.

In the holographic interferometry apparatus of the patent application an object is arranged for synchronous rotation with a holographic recording plate on a motor shaft to thereby provide a constant spatial relationship between the object and plate. A pulsed source of coherent light is optically divided into an object and a reference beam which are expanded by separate lenses and directed symetrically of the axis of the rotating object. The expanded reference beam illuminates the holographic plate while the expanded object beam is scattered off the rotating object back to a centrally-apertured fully reflective mirror disposed concentrically of the object beam axis. The object beam is reflected by the mirror onth the holographic plate.

PAT-APPL-536 076/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Inverted Voltage Gerdien Condenser.
Patent Application,
Bach Sellers. Filed 24 Dec 74, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ions, *Atmospheric sounding, Patents, Measurement, Electrodes, Probes, Concentration(Composition).
Identifiers: *Patent applications, PAT-CL-324-71, *Ion spectrometers, *Gerdien condensers.

It is well known that the interaction of air molecules with energy radiation produces various, charged, ionic species. Ultraviolet radiation from the sun and radioactive radiation from the bombs and reactors are examples of such ion-producing, energy radiation. The present invention relates to atmospheric testing instruments and in particular to ion spectrometers. A 'Gerdien Condenser' spectrometer for use in a moving air environment for measuring ion densities is described wherein a constant, electric field is provided in the direction opposite to prior art devices so that the outer cylindrical electrode of the condenser functions as the ion collector.

PAT-APPL-582 044/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Paint-on Thermocouple.
Patent Application,
Warren K. Smith. Filed 29 May 75, 6p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Thermocouples, Patents, Films, Substrates, Printing.
Identifiers: *Patent applications, PAT-CL-117-212.

The patent application relates to thermocouples fabricated by painting lines of two dissimilar thermal-element materials on a non-conducting substrate such that the painted lines intersect at the location where temperature is to be measured. Alternatively the paint may be thinned to the consistancy of ink and used in a printing process. Thermocouples may be thus formed on paper, cloth or plastic surfaces, for example.

PAT-APPL-588 738/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Weapons Training Simulator Utilizing Polarized Light.
Patent Application,
Windell N. Mohon, George Derderian, and Denis R. Breglia. Filed 20 Jun 75, 14p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Naval training, *Gunnery trainers, *Optical equipment, Simulation, Light, Motion picture film, Combat readiness, Feedback, Circuits, Target lead indicators, Accuracy, Target acquisition, Firing error indicators, Electronic equipment, Patents.
Identifiers: PAT-CL-353-20, *Patent applications, Polarized light.

The patent application uses optics and electronics in gunnery training via simulation. A past and continuing need exists to train military in simulated combat conditions in a safe, low-cost manner without the requirement of firing live ammunition.

PAT-APPL-599 741/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Precision Aerosol Divider.
Patent Application,
Virgil A. Marple, and Kenneth T. Whitby. Filed 28 Jul 75, 12p DOCKET/MIN-2371
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Aerosols, *Size separation, *Particles, Separators, Particle size distribution.

When it was previously desired to calibrate aerosol mass concentration instruments usually a dust box or wind tunnel was used in the operation. A filter in the box or tunnel retained the sampled particles. The deficiency with these types of sampling devices is that differences of air velocity and inlet sizes at the mass sampling instrument input and the filter result in sampling differences. The patent application relates to a precision aerosol divider. The divider is made up of a filter holder with an isokinetic probe in the center that is connected to the inlet of the monitoring instrument.

PAT-APPL-600 255/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Optical Measurement of the Difference in Alignment Between Reference Frames.
Patent Application,
John C. Snowdon. Filed 30 Jul 75, 13p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Optical equipment, *Alignment, Patents, Mirrors, Degrees of freedom.
Identifiers: *Patent applications, PAT-CL-356-152, Three degrees of freedom.

This invention relates to the optical measurement of the alignment error of the three degrees of freedom of a plurality of coordinate reference frames with the three degrees of freedom of a relatively absolute reference frame.

PATENT-3 899 252 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NDIR Gas Analyzer Based on Absorption Modulation Ratios for Known and Unknown Samples.
Patent.
J. Dimeff. Patented 12 Aug 75, 10p PAT-APPL-484 208
Misc-Filed 28 Jun. 1974 Supersedes N74-28933 (12 - 18, p 2174).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Analyzers, *Gas analysis, *Radiation absorption, *Signal generators, Gas density, Modulation, *Patents.
Identifiers: PAT-CL-356-51.

A nondispersive gas analyzer is described. The analyzer is provided with means responsive to the fluctuating intensity of radiation passed through a density modulated known and unknown gas sample for generating a signal containing the frequency modulation of the samples. Included in the signal generation is a means for selectively amplifying those components directly related to the frequency of modulation of the known and unknown samples and a means for forming a ratio of said components for generating a signal proportional to the density of the known gas in the unknown gas sample.

PB-245 175/5GA PC$7.50/MF$2.25
Environmental Analysts, Inc., Garden City, N.Y.
Aquatic Research Vessel Detailed Engineering Design and Biological Experimental Design.
Final rept.
Jul 74, 233p NYSERDA-75/08

Descriptors: *Electric power plants, *Environment simulators, Cooling systems, Condensers(Liquefiers), Steam electric power generation, Experimental design, Entrainment, Impingement, Aquatic biology, Fishes, Intake systems, Water pollution.
Identifiers: *Thermal pollution.

The report presents the design for experimental equipment development to simulate power plant cooling systems and to be incorporated into a research vessel. Two systems are described: (1) a condenser system which can simulate the temperature, pressure and biocides conditions of power plants for evaluation of the effects of condenser entrainment on aquatic organisms; and (2) an intake system to test in-situ the effects of various intake screen types and configurations on the impingement of fish. An experimental biological program for the study of entrainment and impingement using the condenser and intake simulators is also presented.

PB-245 197/9GA PC$5.25/MF$2.25
Acurex Corp., Mountain View, Calif. Aerotherm Div.
Design, Fabrication, and Installation of a Particulate Aerodynamic Test Facility.
Final rept.,
Dale D. Blann, Ken A. Green, and Larry W. Anderson. Oct 74, 125p Aerotherm-74-108
EPA/650/2-74/103
Contract EPA-68-02-0625

Descriptors: *Air pollution, *Test facilities, *Aerosols, Combustion products, Fuel oil, Coal, Chemical analysis, Instrumentation, Design, Particles, Flue gases, Wind tunnels, Flue dust, Control equipment, Installing, Chemical laboratories, Gas analysis.
Identifiers: Air pollution sampling, Air pollution detection, Particulates.

The report presents the trade-offs and design considerations, component selection criteria, and final design details for a particulate aerodynamic test facility. The design meets a range of performance specifications for the test gas, including test section gas velocities to 90 ft/sec, temperatures to 450F, and variable humidity and gas composition, including particulates.

RD/B/N-3273 PC$4.50/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Model for Predicting the Reflection of Ultrasonic Pulses from a Body of Known Shape.
D. M. Johnson. Mar 75, 26p

U.S. Sales Only.

Descriptors: Pulse techniques, Reflection, Shape, Surface properties, Ultrasonic testing.

For abstract, see NSA 32 08, number 19663.

14C. Recording Devices

AD-A016 254/5GA PC$3.25/MF$2.25
Naval Weapons Center China Lake Calif
Recording and Processing of Thermovision Data.
Technical publication,
Barry L. Thompson. Aug 75, 13p Rept no. NWC-TP-5778

Descriptors: *Infrared tracking, *Infrared images, *Image processing, Video recording, Analog systems, Data processing, Tape recorders, Thermovision.
Identifiers: Multiband spectral reconnaissance, Remote sensing.

Improved techniques have been developed for the analog recording of AGA Thermovision data using commercially available tape recorders. Linear and nonlinear recording and reproduction of the video signal from the pre-amplifier yield a record of the instrument's output with little loss in accuracy, resolution, and dynamic range. When this raw video signal is subsequently reproduced and inserted into the Thermovision monitor, all of the processing functions in the monitor can be used for reduction and analysis of the data. A crosshair generator adapted to a Thermovision format can be used to indicate the aim point of an infrared tracker on an infrared image of the target in the same spectral band.

N75-30639/9GA PC$3.25/MF$2.25
South Dakota State Univ., Brookings. Remote Sensing Inst.
Airborne Thermography of Temperature Patterns in Sugar Beet Piles.
D. G. Moore, and S. Bichsel. May 75, 21p NASA-CR-143384, RSI-SDSU-J-75-05
Contract NGL-42-003-007

Descriptors: *Airborne equipment, *Sugar beets, *Temperature distribution, *Temperature measuring instruments, Infrared scanners, Performance prediction, Snow cover, Thermal emission.

For abstract, see STAR 1321

14D. Reliability

AD-A015 668/7GA PC$3.75/MF$2.25
George Washington Univ Washington D C Inst for Management Science and Engineering
Some Stochastic Characterizations of Multivariate survival,
William B. Buchanan, and Nozer D. Singpurwalla. 18 Jul 75, 32p Rept no. Serial-T-319
Contracts N00014-75-C-0729, F33615-74-C-4040

Descriptors: *Reliability, *Multivariate analysis, *Distribution functions, *Wear resistance, *Shock(Mechanics), Mathematical models, Exponential functions, Survival(General), Aging(Materials), Shock resistance.
Identifiers: Shock models, Survival functions.

This paper deals with multivariate analogues to the five well developed univariate characterizations of wear. The objective is to explore variations of these five analogues. study their properties and obtain implications between them. A rationale is provided as to how some of the multivariate variations arise by considering a multivariate shock model. This shock model is based on the multivariate exponential distribution of Marshall and Olkin and the theory of univariate shock models and wear processes of Esary, Marshall and Proschan.

14E. Reprography

N75-30511/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Reflectance Characteristics of the Viking Lander Camera Reference Test Charts.
S. D. Wall, E. E. Burcher, and D. J. Jabson. Sep 75, 31p NASA-TM-X-72762

Descriptors: *Spaceborne photography, *Spectral reflectance, *Viking lander spacecraft, Calibrating, Channels (Data transmission), Heat measurement, Optical scanners, Radiometers.

For abstract, see STAR 1321

N75-30515/1GA PC$3.25/MF$2.25
ESL, Inc., Sunnyvale, Calif.
A Procedure for Standardization of Color Infrared Film Response.
R. L. Lapado, and R. E. Ekstrand. Aug 73, 18p NASA-CR-2575
Contract NAS2-7064

Descriptors: *Color photography, *Infrared imagery, *Infrared photography, *Photographic film, Aerial reconnaissance, Earth resources, Remote sensors.

For abstract, see STAR 1321

15. MILITARY SCIENCES

15C. Defense

AD-A015 876/6GA PC$3.75/MF$2.25
Army War Coll Carlisle Barracks Pa
Japan: Military Options for the 1980'S.
Individual research project,
Gerald F. Wilson. 23 May 75, 49p

Descriptors: *National defense, *Foreign policy, Japan, United States Government, Military forces(Foreign), Military forces(United States), Nuclear weapons, Doctrine, Treaties, Planning, Threat evaluation, Survival(General).
Identifiers: National security.

With the gradual reduction of the US presence in Asia, future US policy in that area centers more and more on Japan. The foundation of the US policy must be based on an accurate assessment of the current and future direction of Japanese security policy. In spite of repeated assurances on the part of the US that it intends to honor its commitments to the security of Japan under the 1960 Security Treaty, events of the recent year have caused Japan to seek reaffirmation of US intentions to include the nuclear shield. This perception of questioning US intentions and resolve has served as the catalyst for a call for a fundamental reevaluation of Japanese security policy. The basic question is to identify the spectrum of security options that are open to Japan and access the probability of which will be adopted. While the range of alternatives runs from neutralization to nuclear rearmament, it is concluded that Japan will find it in her best interests to maintain her security arrangement with the US and continue her gradual qualitative upgrading of the Self Defense Force. (Author)

AD-A015 973/1GA MF$2.25
Army Construction Engineering Research Lab Champaign Ill
Facility Simulation Model for Advanced BMD Systems. Volume VII: Data Base.
Final rept.,
A. Kao, R. Blackmon, and E. McDowell. Apr 75, 241p Rept no. CERL-TR-C-28-Vol-7
See also Volume VI, AD-A010 632.
Availability: Available in microfiche only.

Descriptors: *Antimissile defense systems, *Hardened structures, *Computerized simulation, *Data bases, Heating, Ventilation, Air conditioning equipment, Facilities, Underground facilities, Power equipment, Computer programming.

This data base volume describes the data base developed to support the structural, power, mechanical (HVAC/PC), and miscellaneous modules. Assumptions and methods used to derive the data and formats used to store the data are documented.

AD-A016 283/4GA PC$5.75/MF$2.25
Miami Univ Coral Gables Fla Center for Advanced International Studies
Soviet Civil Defense in the Seventies.
Final rept.,
Leon Goure. Sep 75, 133p
Contract DAHC20-70-C-0309
See also report dated Jun 73, AD-763 482.

Descriptors: *Civil defense, *Government(Foreign), USSR, Threat evaluation, Attitudes(Psychology), Organizations, Planning, Industrial relations, Population, Surveys.

This report is a survey of Soviet programs and activities in civil defense in the 1970's. It provides a description and analysis of Soviet attitudes on the need for and value of civil defense and of U.S.S.R. Civil Defense mission, organization, plans, programs, and their implementation, with particular emphasis on recent new developments.

15E. Logistics

AD-A015 624/0GA PC$3.75/MF$2.25
Naval Training Equipment Center Orlando Fla Training Analysis and Evaluation Group
Acquisition Cost Estimating Using Simulation.
Final rept.,
Henry C. Okraski, and William F. Parrish, Jr. Sep 75, 29p Rept no. TAEG-TM-75-4

Descriptors: *Cost estimates, *Computerized simulation, Government procurement, Logistics support, Computer programming, Mathematical models, Risk, Uncertainty.
Identifiers: ACES model.

Acquisition cost estimates developed as single point values are, at best, misleading and, at worst, impossible to achieve. Single point estimates do not sufficiently reflect the assumptions, judgment or apprehensions of the estimator. This paper deals with a technique for incorporating uncertainty and risk into the acquisition cost estimating procedure such that the estimates are presented as a range of values, encompassing engineering, manufacturing and logistic support estimates. The cost estimating model, a pragmatic application of simulation and classical cost estimating precedures, has been programmed in BASIC and is generalizable and exportable.

AD-A015 669/5GA PC$3.25/MF$2.25
George Washington Univ Washington D C Program in Logistics
A Comparison of Properties of Three Estimators of the Parameters of a Poisson Distribution Truncated below One, When the Sample Size is Small,
Rosedith Sitgreaves. 8 Aug 75, 20p Rept no. Serial-T-311
Contract N00014-75-C-0729

Descriptors: *Logistics, *Poisson density functions, *Approximation(Mathematics), *Distribution functions, Estimates, Truncation, Sampling, Probability, Inventory control.
Identifiers: Maximum likelihood estimates, Estimator, Statistical sampling.

This paper examines properties of three estimators of the parameter of a Poisson distribution truncated below one. For small sample sizes, namely, samples of 1, 2, and 5, it was shown that using the criterion of the expected squared error of estimate, the maximum likelihood estimator and the sample mean, both of which are biased, are admissible, while the best unbiased estimator is inadmissible. It becomes admissible only when its expected squared error coincides with that of the maximum likelihood estimator when n = 5. (Author)

AD-A015 694/3GA PC$7.50/MF$2.25
Arinc Research Corp Washington D C
Application of the Commercial Airline Acquisition Methodology to Department of the Navy Electronic Equipment Acquisitions.
Final rept. 10 Dec 74-15 Oct 75,
L. J. Graham. 15 Oct 75, 239p Rept no. 1313-01-1-1447
Contract N00123-75-C-0756

Descriptors: *Military procurement, *Electronic equipment, Naval equipment, Acquisition, Cost effectiveness.

The objective of the study was to investigate the application of the Commercial Airline Acquisition Methodology(CAAM) to two selected Department of the Navy (DN) electronic equipment acquisitions. The approach taken was to describe the CAAM and formulate CAAM selection criteria and equipment profile from which candidate programs within NAVELEX and NAVAIR were identified. A comparison was performed of the two methodologies and the two candidates which identified similarities, differences, advantages, and disadvantages. Conclusions and recommendations were formulated and a recommended acquisition methodology developed which highlights those features of CAAM potentially attractive to the DN acquisition of electronic equipment. Potential cost benefits of the recommended acquisition methodology were identified. A pilot program was developed to implement the recommended acquisition methodology for one candidate equipment program.

AD-A016 023/4GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
The Relationship of the Quality of Delivered Products to Department of Defense Procurement Policies and Procedures.
Master's thesis,
Lawrence M. Kruse, and Dmitri Taras. Aug 75, 98p Rept no. SLSR-20-75B

Descriptors: *Department of Defense, *Military procurement, *Quality assurance, Logistics, Statistical tests, Quality control, Contract administration, Regression analysis, Theses.
Identifiers: Chi square test.

The relationship of the quality levels of delivered products to Department of Defense procurement policies and procedures was explored by Chi-square and multiple regression statistical tests on a quality audit program sample of San Antonio Air Logistics Center spare parts contracts. The procurement process variables studied were priority of requirement, complexity of item, comtrast specifications, type of inspection clause, type of solicitation, market environment, size of contractor, type of contractor quality capability evaluation, type of contract price agreement, type of contractual instrument, contract modifications, contract administration activity, and contract administration activity quality assurance functions.

AD-A016 028/3GA PC$3.75/MF$2.25
George Washington Univ Washington D C Inst for Management Science and Engineering
Minimizing the Cost of Servicing a Product Subject to an Expected Completion Time Constraint.
Scientific rept.,
James E. Falk, and Marshall Rose. 22 Aug 75, 32p Rept no. Serial-T-321
Contract N00014-75-C-0729

Descriptors: *Maintenance, *Scheduling, Mathematical programming, Convex sets, Repair, Preventive maintenance, Mathematical models, Heuristic methods.
Identifiers: *Maintenance management, Nonconvex programming.

This paper describes a problem in which end products, such as aircraft, are periodically serviced, owing to the failure or preventive maintenance of repairable items. Given the required sequence of item reinstallations, the item resupply times, and item repair probabilities, a relation between the item resupply times and the expected end-product service time is derived. An exact algorithm designed to minimize the total cost of repair subject to a constraint on the expected service time is presented. A heuristic algorithm yielding the entire 'minimum cost per expected service time' curve is also described.

AD-A016 035/8GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Study to Determine a Relationship Between Flying Hours and Flying Proficiency for the KC-135A/Q Aircraft.
Master's thesis,
William M. Henggeler, and Nestor K. Ovalle. Aug 75, 93p Rept no. SLSR-23-75B

Descriptors: *Operational readiness, *Air Force planning, Flight, Time, Correlation techniques, Comparison, Reduction, Proficiency, Theses, Regression analysis, Mathematical models.
Identifiers: C-135 aircraft, KC-135A aircraft, Flying time.

The United States Air Force's operational readiness posture is a function of flying proficiency. Flying time is an important factor in achieving and maintaining an optimal level of flying proficiency. This study attempted to measure the effect of flying hour reductions (resulting from energy conservation and fuel reduction programs) on flying proficiency in order to determine if a statistical correlation can be applied for use as a predictor of flying proficiency as a function of flying time. The study provided a comparison of proficiency analysis before flying hours were significantly reduced and after their reduction. The methodology and analysis of this study could be used to generate future studies on all types of aircraft, and, therefore, extend the analysis to the effects of flying time on proficiency throughout the Air Force.

AD-A016 036/6GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Analysis of the Control and Importance of Strategy Factors in Planning for Negotiation of Procurement Contracts.
Master's thesis,
Henry W. Waldman, and John K. Rutledge. Aug 75, 100p Rept no. SLSR-21-75B

Descriptors: *Air Force procurement, *Strategy, Contracts, Negotiations, Decision making, Surveys, Questionnaires, Theses, Statistical tests.

There is an assumption that personnel at all levels of procurement organization are aware of and agree upon the strategic factors employed in the management of contract negotiations. This assumption is largely unsubstantiated in the literature. This study conducted an exploration into the awareness and agreement among procedurement personnel regarding the relative importance and functional control of strategy employed in Air Force contract negotiations.

AD-A016 038/2GA PC$7.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Simulation of the Reparable Processing Procedures Applicable to Reliability Improvement Warranties.
Master's thesis,
Harvey L. Nixon, Jr., and Charles B. Hitchcock. Aug 75, 216p Rept no. SLSR-36-75B

Descriptors: *Logistics management, *Cost analysis, Costs, Life cycles, Reliability, Maintainability, Mathematical models, Computer programs, Theses, FORTRAN.
Identifiers: *Life cycle costing, *Reliability improvement warranty.

The Reliability Improvement Warranty (RIW) concept is a procurement methodology which is rapidly being implemented in the United States Air Force. Effective use of this concept is contingent on expeditious movement of RIW components between Air Force bases and the contractor. Several reparable processing procedures have been used with varying degrees of success, but there is currently no established technique to aid in determining the optimum processing procedures. The authors conclude that a simulation model has been constructed which can be of assistance to the material manager and procurement officer in selecting an optimum reparable processing procedure.

AD-A016 040/8GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A Model to Predict Final Cost Growth in a Weapon System Development Program.
Master's thesis,
Anthony S. Babiarz, and Peter W. Giedras. Aug 75, 173p Rept no. SLSR-49-75B

Descriptors: *Weapon systems, *Cost analysis, Procurement, Costs, Risk, Uncertainty, Delphi techniques, Mathematical models, Computer programs, Theses, Logistics, FORTRAN.
Identifiers: *Risk analysis, FORTRAN 4 programming language.

The increasing cost growth within the DoD military weapon system acquisition process has been the object of attention for many years. With limited resources and shrinking budgets a viable technique to monitor and control cost growth is needed. The reason for cost growth may be related to the elements of uncertainty within a development program. A conceptual model, previously developed to cope with uncertainties in a weapon system acquisition program, was used to determine its applicability for use in the present study. The model relates the concepts of entropy, information, uncertainty and costs in an effort to predict final costs based on a measure of uncertainty. The measure of uncertainty is entropy, or a lack of order in the information available to the program manager. The model attempts to express final development cost as a ratio of initial cost estimates to program entropy.

AD-A016 116/6GA PC$5.25/MF$2.25
Army Aviation Systems Command St Louis Mo
Sources and Nature of Cost Analysis Data Base Reference Manual.
Interim rept.,
Ralph W. Lilge. Sep 75, 108p Rept no. USAAVSCOM-TR-75-37

Descriptors: *Cost analysis, *Data bases, *Logistics management, Cost estimates, Government procurement, Instruction manuals.

Citing specific examples, the report examines, evaluates, analyzes, and portrays the sources and nature of the cost analysis data base emphasizing important interrelationships between process (gathering, normalization, evaluation), professional skill requirements, the planning of future report revisions, and the development of new data sources. For analysis, the main body of the report employs an expanded 13-step format. Entries on the format were obtained from personal interviews. The report is organized to permit future changes and to facilitate cross-referencing.

AD-A016 153/9GA PC$3.25/MF$2.25
Army Natick Development Center Mass Food Engineering Lab
Efficient Use of Modularization in Transportation Systems.
Technical rept.,
Joseph S. Boziuk, III. Dec 74, 25p Rept no. FEL-22 NDC-TR-75-105-FEL

Descriptors: *Logistics planning, *Containers, *Transportation, Food, Army planning, Cost effectiveness, Computer applications, Optimization, Losses, Packaging, Sizes(Dimensions), Modular construction.

This study suggests a means of most economically utilizing several different modes of transportation (container sizes). Using the digital computer, a computer program has been written which will define the optimum module dimensions on the basis of least total internal cubic loss for a variable set of container sizes. In order to yield the most economically efficient dimensions, the relative frequency of use of each container size was also incorporated into the minimum cubic loss criterion.

AD-A016 262/8GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Appraisal of the Short-Term Cost Results of a Selected Number of Air Force Should Cost Studies.
Master's thesis,
William E. Schaefer, and Roy F. Birkhead. Aug 75, 85p Rept no. SLSR-2-75B

Descriptors: *Air Force procurement, *Contracts, *Cost analysis, Weapon systems, Costs, Logistics, Production engineering, Contract administration, Management planning and control, Theses.
Identifiers: *Should cost analysis, *Contract pricing, *Contract negotiations.

Should Cost briefly can be described as a technique of contract pricing which seeks to determine a realistic price objective which reflects reasonably achievable economies and efficiencies of contractor operations. The Air Force has performed a number of Should Cost studies, each with the stated objective of achieving the desired results contemplated by the above definition. Has the Air Force achieved these results. Up to this point, this question has not been easily answerable since the final cost outcomes have not been available as a basis against which originally negotiated cost targets could be compared. Based upon a limited sample of four contracts which were negotiated using the Should Cost technique, the study showed that Should Cost, as used by the Air Force, may be producing results which are not more effective than those experienced from contracts negotiated using conventional cost analysis.

AD-A016 263/6GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Analysis of the Relationship of Overage Time Spans in the Contract-Closure Process and Opportunity Costs.
Master's thesis,
Frederick N. Galante, Ronald J. Peterson, and Rick J. Williams. Aug 75, 110p Rept no. SLSR-3-75B

Descriptors: *Logistics planning, *Contracts, Government procurement, Department of defense, Regression analysis, Hypotheses, Theses.
Identifiers: *Contract closure process, *Opportunity costs, *Logistics management.

Department of Defense acceptance of goods or services purchased by contract does not signify the completion of a contract. The completion of the required administrative tasks subsequent to acceptance is called the contract-closure process. Delays in completing the contract-closure process are creating opportunity costs. The opportunity cost of an extended contract-closure process is the alternative that is sacrificed to maintain the present contract-closure process. The earlier the closure process is completed, the earlier excess funds can be released to other government projects. The study analyzed the overage contracts on the Contract Status Report issued by Air Force Contract Management Division. Factors that increase the overage time span were identified. In addition, the opportunity cost (over $2.8 million) associated with these factors was calculated. The conclusions of this study indicate, (1) overage time span increases with face value, (2) overage time span decreases with an increase in unliquidated obligation, (3) a few overage reason codes have a significant impact on the overage time span of contracts, and (4) a majority of the opportunity cost incurred is attributable to a small number of overage reason codes.

AD-A016 264/4GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
Acquisition Production Management Tasks: A Program Office/AFPRO Comparison of Relative Task Size and Priority.
Master's thesis,
William K. Goss, and Lyle W. Lockwood. Aug 75, 173p Rept no. SLSR-5-75B

Descriptors: *Logistics planning, *Production models, Government procurement, Weapon systems, Decision making, Theses.
Identifiers: *Production management.

DOD policy in the 1970's has reflected increasing concern with production management. Decisions to produce or to redirect production effort affect production efficiency and weapon system cost, schedule, and performance. The Air Force expects production management activities to be conducted under a close-working relationship between the program office and the system program. Program decisions are directly influenced by opinions from the production elements of these offices. The study was designed to compare opinions of program office and Air Force Plant Representative Office (AFPRO) production elements about the production tasks they perform. Responses were analyzed to determine which tasks consumed the most perceptions of task time and importance existing in the counterpart production elements.

AD-A016 267/7GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
An Evaluation of the Use of the Logistics Composite Model to Measure the Effectiveness of Aircraft Flying Schedules.
Master's thesis,
James A. Boyd, Jr., and Gary J. Toy. Aug 75, 160p Rept no. SLSR-8-75B

Descriptors: *Logistics planning, *Automation, *Aircraft maintenance, Scheduling, Computer applications, Systems engineering, Mathematical models, Mission profiles, Effectiveness, Simulation, Statistical analysis, Mathematical prediction, Air Force planning, Theses.
Identifiers: Recommendations.

A current objective of the Study to Automate Logistics is the development of a computerized system to schedule aircraft maintenance and flying activities at the wing level. The authors saw simulation in the Logistics Composite Model (L-COM) as a possible evaluation method for computer produced schedules. 26 weekly flying schedules, previously executed in an F-4E wing, were collected and simulated in L-COM. Mission effectiveness, defined as the ratio of sorties flown to sorties requested, resulting from the L-COM simulation was compared with the mission effectiveness actually achieved.

AD-A016 270/1GA PC$5.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
Cost/Schedule Control System Criteria: An Analysis of Managerial Utility.
Master's thesis,
Marion A. Ostdiek, and Richard T. Estes. Aug 75, 131p Rept no. SLSR-15-75B

Descriptors: *Cost analysis, *Logistics planning, *Weapon systems, *Contracts, Government procurement, Management information systems, Management planning and control, Theses.
Identifiers: *Logistics management, Utility functions, Planning programming budgets.

The Cost/Schedule Control System Criteria (C/SCSC) is imposed on a contractor's management information system during the performance of a contract for a major weapon system. Previous studies on C/SCSC had identified managerial resistance to the criteria. Data, gathered through structured interviews with military and contractor managers, was analyzed to find if a predetermined set of attitudes affected the perceived utility of C/SCSC. The selected variables of acceptance of quantitative techniques, cost consciousness, knowledge of quantitative techniques, and hierarchical position were studied as major factors influencing the perceived utility of the criteria. Relationships between the selected variables were not supportive of all five stated hypotheses; however, the study provided detailed data on the selected variables and on C/SCSC as a management tool. After a review of the managers' opinions and the available data, a conclusion was reached showing that the criteria in its present form is not sufficiently productive for the project goals. The study also indicates that a significant difference exists between military and civilian managers. The contractor manager exhibited a high correlation between perceived utility and each of four variables while the military manager shows this relationship between perceived utility and only one of the four variables.

AD-A016 272/7GA PC$4.75/MF$2.25
Institute for Defense Analyses Arlington Va Cost Analysis Group
An Army Logistic Support Information System,
Francis L. McDonald. Mar 75, 78p Rept no. P-1110 IDA/HQ-75-17188
Contract DAHC15-73-C-0200

Descriptors: *Logistics support, *Management information systems, Resource management, Maintenance management, Army planning, Cost analysis, Data acquisition, Estimates, Methodology, Requirements, Classification.
Identifiers: Alternatives, Logistics management.

This study provides an information system to be used by OASD/PA and E in obtaining data on a regular basis from Army logistic cost and workload reporting systems. These data will permit OASD/PA and E to maintain current the IDA-developed methodology for estimating Army central supply and maintenance resource requirements. This methodology was designed to be used in studies of defense resource allocations related to proposed alternative Army force structures.

15F. Nuclear Warfare

AD-A015 745/3GA PC$3.75/MF$2.25
Aeronautical Systems Div Wright-Patterson AFB Ohio
A method for Determining Aerodynamic Characteristics for Mission Completion Studies in a Nuclear Environment.
Final technical rept. 15 Jan-1 Apr 74,
Robert R. Snodgrass. Jul 75, 48p Rept no. ASD-TR-75-3

Descriptors: *Nuclear explosion damage, *Tanker planes, *Wings, Damage assessment, Aerodynamic drag, Mathematical prediction, Aerodynamic characteristics, Leading edges, Wing tips, Blunt bodies, Surface roughness, Blast, Dynamic response, Jet transport planes, Miss distance, Range(Distance), Airburst, Boundary layer, Lift to drag ratio, Coefficients, Missions, Refueling in flight, Hardened structures.
Identifiers: KC-135A aircraft, C-135 aircraft.

The existence of a nuclear bomb minimum miss distance which will permit mission completion has been discussed for a number of years. This study, for the first time, endeavors to define the mission essential aerodynamics associated with a mission completion study. Although this study is specifically directed toward the KC-135A, it contains the essential requirements for a general study on any system. Ground rules and assumptions are presented for defining the characteristics which would be associated with the aerodynamics of a nuclear blast degraded system. This approach to mission completion can be made with a sequence of aerodynamic responses to structural damage due to the nuclear blast environment associated with burst distances. This damage is then related to the degraded aircraft performance and its ability to continue the mission. (Author)

AD-A015 837/8GA PC$4.25/MF$2.25
Rand Corp Santa Monica Calif
Damage Probabilities for Small-CEP, Low-Yield Airburst/Groundburst Attacks Against Selected PVN and QVN Point Targets.
Interim rept.,
D. C. Kephart, and M. J. Parise. Aug 75, 52p
Rept no. R-1820-PR
Contract F44620-73-C-0011
See also report dated Nov 73, AD-777 141.

Descriptors: *Nuclear weapons, *Kill probabilities, Circular error probable, Nuclear warheads, Nuclear explosion damage, Airburst, Overpressure, Yield(Nuclear explosions), Surface targets, Computer programs, Tables(Data).
Identifiers: *Single shot kill probabilities, Point targets, JOSS programming language.

The report presents computed tables showing the single-shot probability of damage to a target as a function of yield and CEP, for a weapon bursting either at ground level or at an altitude that approximately maximizes the probability of blast damage. The tables cover 28 P-type and 12 Q-type targets of current military interest. Additional spot calculations involving yields, CEPs, and vulnerability numbers not listed in this report can be made using Rand's circular slide rule calculator R-1380-PR.

15G. Operations, Strategy, and Tactics

JPRS-65733-1 PC$7.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
The General Staff in the War Years--Book Two. Part I,
S. M. Shtemenko. 22 Sep 75, 211p
Trans. of mono. Generalnyi Shtab v Gody Voiny Kniga Vtoraya, Moscow, 1973 p1-511. See also JPRS-65733-2.

Descriptors: *Military operations, *USSR, *Warfare, History, Translations.
Identifiers: *World War 2.

The report contains the memoirs of Army General Sergey Matveyevich Shtemenko on the work of the General Staff in the years of the Great Patriotic War.

JPRS-65733-2 PC$7.00/MF$2.25
Joint Publications Research Service, Arlington, Va.
The General Staff in the War Years--Book Two. Part II,
S. M. Shtemenko. 22 Sep 75, 181p
Trans. of mono. Generalnyi Shtab v Gody Voiny Kniga Vtoraya, Moscow, 1973 p1-511. See also JPRS-65733-1.

Descriptors: *Military operations, *USSR, *Warfare, History, Translations.
Identifiers: World War 2.

The report contains the memoirs of Army General Sergey Matveyevich Shtemenko on the work of the General Staff in the years of the Great Patriotic War.

N75-30817/1GA PC$4.25/MF$2.25
Decision Science, Inc., San Diego, Calif.
An Adaptive Maneuvering Logic Computer Program for the Simulation of One-on-One Air-to-Air Combat. Volume 1: General Description.
Final Report.
G. H. Burgin, L. J. Fogel, and J. P. Phelps. Sep 75, 74p NASA-CR-2582
Contract NAS1-9115

Descriptors: *Computerized simulation, *Fighter aircraft, *Maneuverability, *War games, Computer programs, Flight paths, Mathematical logic, Simulators.

For abstract, see STAR 1321

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

AD-A015 644/8GA PC$3.75/MF$2.25
Naval Surface Weapons Center White Oak Lab Silver Spring Md
Experimental Study of Forces and Moments on Circular Bodies at High Angle of Attack.
Technical rept.,
Andrew Wardlaw, Jr. Aug 75, 30p Rept no. NSWC/WOL/TR-75-66

Descriptors: *Maneuverable reentry vehicles, *Supersonic characteristics, Wind tunnel models, Angle of attack, Slender bodies, Moments, Aerodynamic forces.

Twelve different slender bodies were tested at Mach 2 and 3 in the angle of attack range of 20 and 58 degrees. Normal and yaw forces and moments were monitored. On select models vortex paths were traced using schlieren pictures. Normal forces and moments were studied using the cross flow analogy. The accuracy of this analog appears to be best when the crossflow is supersonic.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A015 649/7GA PC$3.25/MF$2.25
Woods Hole Oceanographic Institution Mass
Uniformly-Sensitive Line Hydrophones.
Technical rept.,
S. T. Knott, F. R. Hess, and R. T. Nowak. Jul 75, 18p Rept no. WHOI-75-36
Contracts N00014-74-C-0262, Nonr-4029(00)

Descriptors: *Hydrophones, *Seismic reflection, Ocean bottom topography, Acoustic detection, Profiles, Sensitivity, Performance(Engineering), Broadband, Signal to noise ratio, Test methods, Sediments, Rock.
Identifiers: Seismic profiles, Design.

A uniformly-sensitive capacitive line hydrophone, dubbed WHOLINE, used as a towed broadband line hydrophone for seismic reflection profiling has produced significant increase in the signal-to-noise ratio. When used in a broadband noise field (less than 10 to several kHz) to detect signals that both approach the array at near normal incidence and are also broadband, the directivity of a long continuous line offers a specific advantage over that of an equal length linear array of openly spaced discrete sensors. Discrete arrays in such a sound field develop side lobes of full sensitivity at a number of frequencies at various angles to the array depending on the element spacing. In contrast, the side lobes characteristic of a continuous line are each successively reduced.

AD-A016 018/4GA PC$5.75/MF$2.25
Johns Hopkins Univ Laurel Md Applied Physics Lab
PASS Program Report: Experimental Digital Beamsteering and Signal Generator Electronics.
Final rept. May 74-Jul 75,
R. E. Miller, M. L. Dwarkin, and T. E. Lyon. Aug 75, 141p Rept no. APL/JHU/QM-75-103
Contract N00017-72-C-4401
See also AD-A016 019.

Descriptors: *Sonar, Parametric devices, Digital systems, Beam steering, Signal generators, Beam forming, Sonar arrays, Power amplifiers.
Identifiers: PASS(Parametric Scanning Sonar), *Parametric scanning sonar.

The purpose of the equipment described in this document is to demonstrate the capabilities of digital beamsteering and signal generation for a Parametric Scanning Sonar (PASS). It provides controlled digital-delay phase shifted excitation to the 61 transducers of an experimental sonar array for steering the beam in roll and pitch with a selection of modulation parameters adequate for evaluating the digital beamsteering technique. The equipment was designed to operate at a nominal carrier frequency of 20 kHz with a 5 kHz difference frequency.

AD-A016 019/2GA PC$4.75/MF$2.25
Johns Hopkins Univ Laurel Md Applied Physics Lab
PASS Program Report: Millstone Test Analysis - 61 Module Array System.
Final rept. May 74-Jul 75,
D. W. Stowe. Aug 75, 97p Rept no. APL/JHU/QM-75-102
Contract N00017-72-C-4401
See also AD-A016 018.

Descriptors: *Sonar, Sonar arrays, Beam forming, Parametric devices, Beam steering, Digital systems, Signal generators, Power amplifiers, Nonlinear systems, Spectrum analyzers.
Identifiers: PASS(Parametric Scanning Sonar), *Parametric scanning sonar.

During in-water tests at the NUSC Millstone Test Facility, the designed signal generator, beamsteering electronics, and power amplifiers were used to drive the 61-module array. The signal generator employed a unique digital technique to pulse-width modulate a square-wave carrier, producing two intense primary frequencies in the water suitable for parametric generation of the difference frequency. The ability to produce 3 different modulation waveforms and to chirp the modulation frequency was also demonstrated. In addition, electronic beamsteering using the APL digital shift-register design was demonstrated between angles of plus or minus 45 degrees without appreciable degradation of the primary beam pattern.

AD-A016 242/0GA PC$3.75/MF$2.25
Naval Underwater Systems Center New London Conn New London Lab
Design and Performance of Parametric Sonar Systems.
Technical rept.,
William L. Konrad. 24 Sep 75, 31p Rept no. NUSC-TR-5227

Descriptors: *Sonar, Parametric devices, Waveforms, Distortion, Beam forming, Underwater sound, Echo ranging, Nonlinear systems.
Identifiers: *Parametric sonar, Nonlinear acoustics.

A brief non-mathematical explanation of the difference frequency generation and beamforming process is followed by a step-by-step design procedure using the Mellen-Moffett parametric source model. The relative merits of projector feed with a single driver supplying both primary frequencies to the projector as opposed to the 'checkerboard' technique are discussed. Distortion in both the parametric source and in receiving systems used in measurements is considered with suggestions on how these problems can be minimized. Applications of the parametric array to communications, echo ranging, and sub-bottom profiling are mentioned, and salient performances from tests of practical sources are listed. Finally, brief discussions of the results obtained from a cavitating, parametric source and from a parametric receiving array are given.

AD-A016 279/2GA PC$3.75/MF$2.25
Texas Univ At Austin Applied Research Labs
A Parametric Sonar Analysis of R. Laval's 'Various Concepts for Future Sonars in Shallow Water',
Thomas G. Muir. 26 Aug 75, 40p Rept no. ARL-TR-75-46
Contract N00014-75-C-0161

Descriptors: *Sonar, *Shallow water, Reverberation, Doppler effect, Sonar arrays, Signal processing, Antisubmarine warfare, Acoustic detection.

The shallow water environment imposes acoustical limitations that preclude effective use of conventional hull mounted sonar. Laval has recently discussed this problem from the standpoint of future concepts for linear sonar systems. The present paper analyzes that discussion from the standpoint of parametric sonar. Topics addressed include doppler resolution, frequency optimization, broadnband signals, increased horizontal directivity, increased vertical directivity, and multistatic techniques. It is argued that parametric arrays could provide improvements in most of these categories. Although the parametric technique has the disadvantage of a low conversion efficiency, the highly reverberant shallow water environment need not necessitate systems of high source level. This and other peculiarities of shallow water acoustics render parametric techniques worthy of consideration in future research and development.

PAT-APPL-375 971/GA PC$3.75/MF$2.25
Department of the Navy Washington D C
Subchannel Decoupling Filters for Echo Location Systems.
Patent Application,
Jeffrey M. Speiser. Filed 2 Jul 73, 26p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Echo ranging, Patents, Electric filters, Autocorrelation, *Signal processing.
Identifiers: *Patent applications, PAT-CL-325-60.

An object of the patent application is to provide an echo-location system capable of separating otherwise unresolvable adjacent scatterers. Another object is to provide an echo-location system whose response at zero doppler to a point scatterer is the sum of two specified autocorrelation functions. Yet another object is to provide an echo-location system wherein the desired signal components have mutually cancelling autocorrelation sides lobes. Portions of this document are not fully legible.

PAT-APPL-449 295/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Crown Float/Decelerator.
Patent Application,
Edgar A. Reed, III, and E. Russell Gonibas. Filed 8 Mar 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Sonobuoys, *Parachute descents, Inflatable structures, Deceleration, Flotation, Patents.
Identifiers: *Patent applications, PAT-CL-9-8-R, Decelerators, Air to sea, Water entry.

It is an object of the patent application to provide an improved, simple, reliable, lightweight, inexpensive, ram-air inflatable flotation and deceleration apparatus for aircraft-launched sonobuoys.

PAT-APPL-466 118/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Nonlinear Array Hydrophone Simulator.
Patent Application,
Michael M. Kijesky. Filed 2 May 74, 12p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Sonar arrays, *Simulators, Patents, Hydrophones, Acoustic arrays, Nonlinear systems, Signal generators, Shift registers, Angle of arrival.
Identifiers: *Patent applications, PAT-CL-340-5.

The patent application describes a device for simulating time delayed outputs resulting from impingement of a point source of sonic energy upon a nonlinear array of hydrophones. An acoustic signal generator provides an analog output signal to a pulse forming circuit which converts the analog signal to a series pulse train which is fed to a shift register clocked at a rate in accordance with the time delays between the hydrophones. Selected outputs from the register are reconverted to analog signals by individual wave forming circuits assigned to each of the shift register outputs. A plurality of noise generators provide noise signal outputs which are independently added to the reconverted analog signals to form a plurality of selectively delayed signals simulative of hydrophone outputs having both signal and noise components, the delays being variable to simulate different angles of sonic energy approach by selection of appropriate shift register outputs.

17B. Communication

AD-A015 635/6GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
Modified Forward Routing for CONUS/CSN AUTOVON.
Technical rept.,
C. N. Shearer. Sep 75, 28p Rept no. TR-26-75

Descriptors: *Telephone systems, *Message processing, Routing, Communication and radio systems, Communications networks, Switching, Algorithms.
Identifiers: Autovon(Automatic Voice Network), Automatic voice network.

The report describes a routing concept for switched-circuit, nonhierarchical, spill-forward communications networks. An algorithm based on this concept has been developed which creates routing tables for all switches in a switched network. These tables appear to be compatible with the current CONUS/CSN AUTOVON switching machines. The subject routing concept has several advantages over current polygrid routing. First, it can be implemented with an algorithm which runs considerably faster than corresponding polygrid routing algorithms. Second, the networks which use this routing concept are near minimum cost. Third, the algorithm may be used to adjust the level of tandem traffic through any of the switches, and to produce at least a specified minimum number of alternate routes from each switch to every destination.

AD-A015 827/9GA PC$9.25/MF$2.25
Stein Associates Inc Waltham Mass
Delta Modulation Digital Filtering Techniques.
Final technical rept. 8 Mar-8 Nov 74,
Howard E. Nichols, Roy M. Westerberg, and James M. Aufiero. Jul 75, 309p Rept no. 6035-11 RADC-TR-75-158
Contract F30602-74-C-0179

Descriptors: *Signal processing, *Digital filters, *Delta modulation, Data transmission systems, Coding, Communication and radio systems, Computerized simulation, Real time, Computer programming, FORTRAN.

The effort has demonstrated the feasibility and practicality of several computationally efficient procedures for simplifying the digital processing of Delta Modulation encoded signals. Design techniques for transversal filters having tap weights quantized to one bit were developed and evaluated. Techniques for direct conversion of CVSD encoded signals to PCM were developed and implemented on a 16-bit fixed-point programmable processor providing realtime computation.

AD-A015 862/6GA PC$4.25/MF$2.25
Mitre Corp Bedford Mass
Characterization and Modeling of the Digital High-Speed Autovon Channel.
Interim rept.,
Kenneth Brayer. Aug 75, 59p Rept no. MTR-2802 ESD-TR-75-79
Contract F19628-73-C-0001

Descriptors: *Communications central, *Voice communications, *Communications networks, *Communication switching centers, *Telephone systems, Digital systems, Communication and radio systems, Computers, Data transmission systems, Channels, High rate, Modems, Markov processes, Models, Errors.
Identifiers: *Autovon, Satin 4.

An interim analysis of error pattern data collected at 4800 b/s and 9600 b/s via digital data transmission on AUTOVON using the Codex 9600 modem has been performed. The data tends to show that errors occur in dense bursts, ranging in length to thousands of bits with significant numbers of bursts of a few hundred bits length. The bursts are generally separated by long error-free intervals. The differences between the 4800 b/s and 9600 b/s data appear to be minimal with fewer bursts at 9600 b/s. No conclusions should be drawn in terms of a 4800 vs 9600 b/s comparison since the data considered in this interim report was not balanced in terms of numbers of bits collected at the different data rates or the different selected switch connections. When equal amounts of data are available for the various switch configurations it should then be possible to compare 4800 and 9600 b/s data. It has been demonstrated that an analytical channel model can be fit to the data, namely a MARKOV channel model. This model can be used for coding analysis by those who do not have the raw channel data and data analysis programs. (Author)

AD-A015 931/9GA PC$4.25/MF$2.25
Coast Guard Research and Development Center Groton Conn
Statistics on Bridge-to-Bridge Frequency Usage at Selected Sites in the Eighth Coast Guard District.
Final rept.,
J. A. McIntosh, and L. B. Brown. Apr 75, 73p
Rept no. CGR/DC-8/75 USCG-D-93-75

Descriptors: *Communications traffic, *Communication and radio systems, Ships, Very high frequency, Frequency modulation, Statistical analysis, Louisiana, Texas, Mexico Gulf.
Identifiers: DOT/4HZ/HZ.

Equipment was assembled and tested to record the time of occurrence and the duration of transmissions on the vessel bridge-to-bridge radio frequency, VHF-FM Channel 13. The input to this equipment was provided by magnetic tape recordings previously obtained at each site over a 24 hour period or by directly connecting the equipment to a VHF-FM monitor receiver. Message length histograms indicated that about 50 percent of all transmissions were of less than 3 seconds in duration and that about 95 percent of all transmissions were of less than 10 seconds in duration. The sites for which data was obtained include Port Allen, New Orleans, Harvey Locks, Venice, Houma, Berwick, Berwick Locks, and Intercoastal City, LA, and Galveston, Port Arthur and Orange, TX.

AD-A015 936/8GA PC$3.75/MF$2.25
Coast Guard Research and Development Center Groton Conn
Statistics on Bridge-to-Bridge Frequency Usage at Selected Sites in the Third Coast Guard District.
Final rept.,
J. A. McIntosh, and L. B. Brown. May 75, 45p
Rept no. CGR/DC-10/75 USCG-D-100-75

Descriptors: *Communications traffic, *Communication and radio systems, Ships, Very high frequency, Frequency modulation, Statistical analysis, New York, New Jersey, Connecticut, Pennsylvania, Delaware Bay, Long Island Sound.
Identifiers: DOT/4HZ/HZ.

Equipment was assembled and tested to record the time of occurrence and the duration of transmissions on the vessel bridge-to-bridge radio frequency, VHF-FM Channel 13. The input to this equipment was provided by magnetic tape recordings previously obtained at each site over a 24 hour period or by directly connecting the equipment to a VHF-FM monitor receiver. Message length histograms indicated that about 50 percent of all transmissions were of less than 3 seconds in duration and that about 95 percent of all transmissions were of less than 10 seconds in duration. The sites for which data was obtained include Governor's Island; Fort Schuyler, NY; Sandy Hook, NJ; Cape Henlopen; The C and D Canal; Philadelphia Naval Shipyard; Eatons Neck, NY; New Haven and Groton, CT.

AD-A015 939/2GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Fine Synchronization of Coherent Frequency Hopping Signals.
Final rept.,
A. F. Thornhill. Oct 75, 24p Rept no. NRL-MR-3137

Descriptors: *Communication and radio systems, *Synchronization(Electronics), Radio receivers, Frequency, Switching, Frequency shift, Carrier waves, Coherence, Phase(Electronics).

A method for precise synchronization of receiver timing with a phase coherent frequency hopping signal has been developed. It is assumed that initial synchronization by other techniques has aligned the receiver frequency hopping sequence with the signal well enough so that the receiver operates on the same frequency as the signal for most of each hop period. Phase comparisons between the signal and a locally generated replica then can be made and summed over a large number of frequency hops to provide a sensitive measure of the remaining synchronization error. Frequency dependent errors in the phasing of quadrature channels in the experimental synchronizer produced ripple in the detector output. Additional ripple was produced by circuits used for combining the quadrature channel outputs. The observed ripple produced reversals in the slope of the error signal, and, in a complete system, would have led to limited instability of synchronization. Criteria have been developed for determining circuit characteristics necessary to reduce the ripple to an acceptable value. The effects on the synchronization method of frequency offsets and of several modulation types have been examined, and techniques have been proposed for maintaining close synchronization in the presence of these effects.

AD-A015 960/8GA PC$4.25/MF$2.25
Naval Academy Annapolis Md
Advance Identification of Catastrophic Traffic Build-Up in the Naval Telecommunication Command.
Research rept.,
Louis T. Roumaya. 2 Jun 75, 95p Rept no. USNA-TSPR-73
Report on a Trident Scholar Project.

Descriptors: *Communications traffic, *Message processing, *Telecommunication, *Radio broadcasting, Control, Scheduling, Automation, Fleets(Ships), Command and control systems, Computerized simulation, Computer programs, Digital computers, Naval equipment, Naval operations.

The Naval Telecommunication Command (NAVTELCOM) carries out for the Chief of Naval Operations, The Dept. of Navy's responsibilities for defense telecommunications. A fundamental problem with the FLeet Broadcast occurs because the new Automated Broadcast Stations can receive and process message faster than the ships of the fleet can receive them. Message backlogs result and corrective measures must be taken. The thrust of this project was an analysis of the various measures to prevent and deal with backlogs occuring in these stations. It focused on the Navy's Automated Communications Station at Norfolk, which is the model for four other systems around the world. Their operation of the Fleet Broadcast was studied and modeled. To evaluate the impact of the proposed changes and other possible changes a computer program for simulating the operation of the Fleet Broadcast was prepared for use on the Naval Academy's Computer System and it is discussed in Appendix B., and listing of the program is included. The report suggests several early implementable changes in the way the broadcast is managed - to improve its operation. (Author)

AD-A016 171/1GA PC$6.25/MF$2.25
Boeing Commercial Airplane Co Seattle Wash
U.S. Aeronautical L-Band Satellite Technology Test Program.
Interim test results 1 Dec 74-1 Jun 75,
E. H. Schroeder, R. W. Sutton, A. D. Thompson, C. V. Paulson, and S. G. Wilson. Jun 75, 174p
TSC-FAA-75-18, FAA-RD-75-111
Contract DOT-TSC-707

Descriptors: *Satellite communications, Radio links, Radio relay systems, Communication satellites, Air to space, Multipath transmission, Modems, Aircraft antennas, L band, Ultrahigh frequency, Microwave communications, Phased arrays, Slot antennas, Errors, Speech recognition, Intelligibility.
Identifiers: DOT, 4HZ/HD, ATS-6 satellite.

The U.S. Aeronautical L-Band satellite test program was performed between September 1974 and April 1975 as part of an international ATS-6 L-Band satellite test program. The U.S. program consisted of both technology and ATC communications demonstration tests. The technology tests were comprised of multipath channel characterization tests; modem tests of voice, data, and ranging; and aircraft antenna tests. Multipath results include delay-Doppler scatter function characteristics and calculations of spectra, spreads and autocorrelations for both over-ocean and CONUS multipath. Comparison of sample results with model prediction is given. Voice modem intelligibility scores, digital data bit error rates and ranging modem performance are presented parametrically as functions of C/N sub 0 and S/I. Experimentally derived gain and multipath rejection performance data are given for the slot-dipoles, phased array, patch, and crossed-slot antennas for various aircraft/satellite geometries.

JPRS-65572 PC$3.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
Peculiarities in the Development of Remote-Communication Methods,
A. S. Blokhin. 29 Aug 75, 10p
Trans. of Elektrosvyaz (USSR) n4 p12-17 1975.

Descriptors: *Telecommunication, *Multiplexing, Automation, Coaxial cables, Transmission, Transmission circuits, Translations, USSR.

The report contains a discussion of the state of remote communications techniques and systems and apparatus which have already been developed and are in use in the USSR.

NTIS/PS-75/773/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Underwater Voice Communication Systems (A Bibliography with Abstracts).
Rept. for Jul 65-Sep 75,
Guy E. Habercom, Jr. Oct 75, 97p*
See also NTIS/PS-75/774.

Descriptors: *Bibliographies, *Underwater communication, *Voice communication, Divers, Underwater swimmers, Underwater telephones, Underwater television, Underwater sound equipment, Speech, Speech recognition.
Identifiers: *Helium speech.

Underwater voice communication systems for divers and underwater submersibles are reviewed in these Government-sponsored research reports. Research in helium speech transmission and associated problems is delineated. (Contains 92 abstracts).

N75-30220/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
The Communications Technology Satellite and the Associated Ground Terminals for Experiments.
D. L. Wright, and J. W. B. Day. 1975, 17p NASA-TM-X-71761, E-8413
Conf-Presented at the Conf. On Commun. Satellites for Health and Educ., Denver, 21-23 Jul. 1975; Sponsored by Aiaa.

Descriptors: *Communication satellites, *Data processing terminals, *Ground support equipment, Canada, International cooperation, Spacecraft design, Telecommunication, United states of america.

For abstract, see STAR 1321

N75-30232/3GA PC$3.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
The Design of a Digital Voice Data Compression Technique for Orbiter Voice Channels.
Final Report.
Aug 75, 40p NASA-CR-144410, TRW-27165
Contract NAS9-14416

Descriptors: *Channels (Data transmission), *Data compression, *Digital data, *Space shuttle orbiters, Feasibility analysis, Performance prediction, Superhigh frequencies, Ultrahigh frequencies, Voice communication.

For abstract, see STAR 1321

N75-30384/2GA PC$3.75/MF$2.25
Signals Research and Development Establishment, Christchurch (England).
Atmospheric Attenuation of Microwave Satellite Links.
R. F. Smith. Jan 75, 29p SRDE-RN-73043, BR46637

Descriptors: *Atmospheric attenuation, *Data links, *Microwave equipment, *Spacecraft communication, Rain, Statistical analysis, Telecommunication, Temperate regions, Tropical regions.

For abstract, see STAR 1321

N75-30386/7GA PC$3.25/MF$2.25
Washington Univ., St. Louis, Mo. Center for Development Technology.
Alternative Communication Network Designs for an Operational Plato 4 CAI System.
R. E. Mobley, Jr., and L. F. Eastwood, Jr.. Aug 75, 25p NASA-CR-143330, CDTCG-R(T)-75/3
Contracts NGR-26-008-054, NSF EC-38871

Descriptors: *Computer assisted instruction, *Radio relay systems, *Spacecraft communication, Cost analysis, Design analysis, Network analysis, Telephony, Ultrahigh frequencies.

For abstract, see STAR 1321

N75-30387/5GA PC$4.25/MF$2.25
City Coll. of the City Univ. of New York. Communication Systems Lab.
Optimal Space Communication Techniques.
Final Report, 15 Jun. 1974 - 14 Aug. 1975.
D. L. Schilling. 14 Aug 75, 52p NASA-CR-143337
Grant NSG-5013

Descriptors: *Delta modulation, *Phase locked systems, *Pulse code modulation, *Space communication, Error correcting codes, Nonlinear systems, Signal to noise ratios, Thermal noise.

For abstract, see STAR 1321

N75-30542/5GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Spaceborne CO2 Laser Communications Systems.
J. H. Mcelroy, N. Mcavoy, E. H. Johnson, F. E. Goodwin, and B. J. Peyton. Jul 75, 54p NASA-TM-X-70947, X-723-75-171
Subm-Submitted for Publication. Conf-Proposed for Presentation at the IEEE Electron. And Aerospace Systems Conf., Washington, D. C., 29 Sep. - 1 Oct. 1975.

Descriptors: *Carbon dioxide lasers, *Laser applications, *Optical communication, *Relay satellites, Data acquisition, Performance prediction, Remote sensors, Satellite tracking, Technology assessment.

For abstract, see STAR 1321

N75-30916/1GA PC$3.25/MF$2.25
Washington Univ., St. Louis, Mo. Center for Development Technology.
Application of Communications Satellites to Educational Development.
Final Technical Report, 1 Sep. 1969 - 31 Aug. 1975.
R. P. Morgan. 31 Aug 75, 13p NASA-CR-143328
Contract NGR-26-008-054

Descriptors: *Bibliographies, *Communication satellites, *Education, *Information systems, *Technology utilization, Educational television, Knowledge, Technology assessment, Telecommunication, Universities.

For abstract, see STAR 1321

PAT-APPL-546 051/GA PC$3.75/MF$2.25
Department of the Navy Washington D C
Variable-to-Block-with-Prefix Source Coding Technique.
Patent Application,
John Lawrence, and Al Roth. Filed 31 Jan 75, 42p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data compression, Coding, Data transmission systems, Patents, Shift registers, Binary arithmetic.
Identifiers: *Patent applications, Random walk, Pascal triangle, PAT-CL-340-347.

The patent application describes a method and apparatus for data compression which uses a random walk through Pascal's triangle which is directed by the incoming random source sequence. The random walk starts at the apex of Pascal's triangle and proceeds downward according to an algorithm until it terminates at a boundary which has been constructed in such a way that the encoding of each source sequence can be accomplished in a fixed number of bits. The fixed-length encoded block consists of a prefix to determine the boundary crossing point in Pascal's triangle and a suffix which represents the encoded form of the input sequence relative to that starting point. Theoretically optimal entropy encoding is achieved by this method.

PAT-APPL-570 927/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
High Speed Fiber Optic Communication Link.
Patent Application,
Franklin H. Fish. Filed 22 Apr 75, 16p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Optical communications, *Fiber optics transmission lines, Patents, Signal processing, Light emitting diodes, Optical waveguides, Digital systems, Data processing, Integrated circuits, Electrooptics.
Identifiers: *Patent applications, PAT-CL-350-96.

The patent application concerns a high speed fiber optic communication link having a differential transmitter circuit for receiving digital data and providing a first output for transmitting a signal representing a logic 'one' and a second output for transmitting a signal representing a logic 'zero'. First and second light emitting diodes are provided for converting the electrical signals into light signals. These light signals are transmitted by optical waveguides to first and second light detecting diodes which convert the light signals back into electrical signals. These converted electrical signals are then amplified by a differential rectifier circuit.

PAT-APPL-573 222/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
High-Speed Manchester Code Demodulator.
Patent Application,
B. R. Jarrett. Filed 28 Apr 75, 13p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Demodulators, Patents, Decoding, Data transmission systems, Phase modulation, Flip flop circuits.
Identifiers: *Manchester codes, *Patent applications.

A demodulator for decoding the Manchester code is described in the patent application in which the bit rate is maximized by using a one shot set up for a pulse width less than one-half the bit period. Control of the one-shot is established so that it is clocked at the bit rate but not at twice the bit rate, in order to receive high data rates serially over a single fiber optic channel.

PAT-APPL-595 254/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
System and Method for Tracking a Signal Source.
Patent Application.
L. N. Mogavero, E. G. Johnsen, J. M. Evans, Jr., and J. S. Albus. Filed 11 Jul 75, 17p NASA-CASE-HQN-10880-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Feedback control, *Tracking (Position), Amplifiers, Computers, Lighting equipment, *Patent applications, Multipliers, Phase detectors, Radio signals, Servomechanisms, Signal processing, Ultrasonic radiation.

A system for tracking moving signal sources, particularly stage performers, is described. A miniature transmitter is attached to the person or object to be tracked and emits a detectable signal of a predetermined frequency. A number of detectors, positioned in a preset pattern, sense the signal and supply output information to a phase detector which applies signals representing the angular orientation of the transmitter to a computer. The computer provides command signals to a servo network which drives a device, such as a spotlight or camera, to track the moving transmitter 10.

PB-244 659/9GA PC$5.75/MF$2.25
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program. Color Television Manufacturers. Documentation of GTE-Sylvania, Incorporated.
9 Sep 74, 148p FTC-752-3003-GTE-Syl

Descriptors: *Manufacturers, *Truth in advertising, *Publicity, *Television receivers, Picture tubes, Color television, Adjusting, Automatic control.
Identifiers: GTE Sylvania Incorporated, GT-Matic televisions.

Documentation is submitted in support of various claims concerning the significant differences of the GT-Matic self-adjusting feature from the automatic adjustment systems used on all other color TV sets; the revolutionary memory circuits used in the GT-Matic self-adjusting process to constantly correct pictures for brightness, contrast, tine, color level, vertical and horizontal hold; the technological superiority of the GT-Matic self-adjusting process over the automatic adjustment systems used on other color TV sets; and the efficacy of GT-Matic self-adjusting feature at making unnecessary further adjustments to the set once the set has been initially adjusted to the owner's satisfaction. Portions of this document are not fully legible.

17E. Infrared and Ultraviolet Detection

AD-912 130/2GA PC$8.75/MF$2.25
Avco Everett Research Lab., Inc., Everett, Mass.
Clear Aperture Anti-Frost Technology.
Final technical rept.
Feb 73, 291p SAMSO-TR-73-198
Contract F04701-70-C-0151
Distribution limitation now removed.

Descriptors: *Infrared windows, *Ice prevention, *Infrared domes, *Infrared detectors, Aerodynamic configurations, Axially symmetric flow, Flow fields, Rotation, Stability, Ice fog, Aircraft canopies, Airspeed, Shroud rings, Wind tunnel models, Density, Buoyancy, Air, Injection, Cryogenics, Detectors, Airborne, High altitude, Moisture, Nitrogen, Convection(Heat transfer), Anemometers, Frost, Hot wire anemometers, Swirling.
Identifiers: Optical apertures.

A theoretical and experimental study of a class of clear aperture anti-frost (CAAF) devices is described. Generalized scaling laws for CAAF operation are derived and verified in laboratory experiments. The design, instrumentation and testing of a 10-inch aperture axial flow CAAF is described, and laboratory operation is demonstrated. It is shown that injection of a warm gas primary flow is permissible, and that a secondary, swirling flow is required for internal flow stabilization. Wind tunnel simulation experiments are summarized and transmission data is presented for simulated open canopy operation. Successful CAAF operation for more than four hours is demonstrated for a 500 pound/hour flowrate.

17G. Navigation and Guidance

AD-A015 823/8GA PC$3.75/MF$2.25
Federal Aviation Administration Washington D C
Integrated National Airspace Communication System (INACS) for the Support of Air Traffic Control Operations in the 1980s and 1990s. Program Planning and Formulation. Phase I Program Plan.
1 Oct 75, 32p Rept no. FAA-INACS-061-221-P1
See also AD-A015 824.

Descriptors: *Communication and radio systems, *Air traffic control systems, Integrated systems, Planning.
Identifiers: INACS(Integrated National Airspace Communication System), Integrated national airspace communication system, DOT/4HZ/HD, DOT/4IZ/ID.

The state-of the-art in communications technology offers opportunities for a substantial reduction in total FAA communications recurring costs together with a significant improvement in overall communications operational flexibility, reliability and service. An integrated national system, which provides both voice and data communications for all FAA operational facilities and the attendant ATC support functions, can save an estimated 100 million dollars per year in the FAA annual communications budget.

AD-A015 824/6GA PC$3.75/MF$2.25
Federal Aviation Administration Washington D C
Integrated National Airspace Communication System (INACS) for the Support of Air Traffic Control Operations in the 1980s and 1990s. System Concept.
8 Sep 75, 32p Rept no. FAA-INACS-061-221-SC
See also Phase 1, AD-A015 823.

Descriptors: *Communication and radio systems, *Air traffic control systems, Systems engineering, Integrated systems.
Identifiers: INACS(Integrated National Airspace Communication System), Integrated national airspace communication system, DOT/4HZ/HD, DOT/4IZ/ID.

The document introduces the concept of an integrated communications approach to meet total FAA operational communications requirements projected for the 1980s and beyond. As a concept, this integrated approach differs from the historical method of satisfying FAA's communications needs by the acquisition or development of dedicated facilities and networks which are designed to serve specific categories of users and which perform specific and dedicated communications functions for these users. State-of-the art communications technology appropriately applied to an integrated system offers opportunities for a substantial reduction in projected total FAA communications recurring costs together with a significant improvement in overall communications operational capability, flexibility and reliability.

AD-A015 881/6GA PC$4.75/MF$2.25
Coast Guard Research and Development Center Groton Conn
Photometric Measurements of Navigational Lights for Boats.
Final rept.,
L. Dennis Farmer, Arthur A. Ferruzzi, and David A. Naus. May 75, 95p Rept no. CGR/DC-11/75 USCG-D-105-75

Descriptors: *Navigational lights, *Boats, *Photometry, Beacons, Red, Green, Intensity, Test methods, Costs, Colors, Catalogs.
Identifiers: *Recreation boats, DOT/4IZ/ID.

This report presents the photometric data taken on 19 different navigational lights for recreation boats. Most of the lights were a red and green combination light. The data includes chromaticity values and the intensity over both horizontal and vertical arcs. (Author)

AD-A015 904/6GA PC$3.75/MF$2.25
Naval Electronics Lab Center San Diego Calif
VLF Navigation Monitor: Engineering Design.
Final rept. Dec 73-May 75,
E. R. Swanson, and J. E. Britt. 28 Jun 75, 30p Rept no. NELC-TR-1959 FAA-RD-75-148
Contract DOT-FA74WAI-425
See also report dated 30 May 75, AD-A013 651.

Descriptors: *Hyperbolic navigation, *Monitors, Very low frequency, Omega navigation, Radio signals, Anomalies.
Identifiers: DOT/4IZ/ID.

Engineering architecture of a monitor to warn of vlf signal anomalies is described. Purpose and function of the monitor are described in a companion report (DOT FA74WAI-425-4). This report describes the basic engineering approach to the monitor design and construction including both hardware and software.

AD-A016 099/4GA PC$4.25/MF$2.25
White Sands Missile Range N Mex Instrumentation Directorate
Inertial-Range Instrumented Hybrid Navigation Systems.
Technical rept.,
R. E. Green, and N. N. Puri. Aug 75, 67p Rept no. STEWS-ID-75-1

Descriptors: *Inertial navigation, Hybrid systems, Guided missile ranges, Kalman filtering, Navigation computers, Instrumentation, Calibration.

The report discusses a Hybrid Navigational System for low altitude airborne tracking and for accurate calibration of range instrumentation equipment. System consists of an airborne inertial platform, transponder for Distance Measuring Equipment (DME) interrogation (providing range and range measurements), barometer type altimeter or a phase array radar, an airborne navigational and filtering computer, and ground based DME. Inertial platform may or may not be torqued. The heart of the system is the navigational computer and the Kalman filter. A reference trajectory is generated by the cubic spline method and along with proper coordinate conversion, the doppler data, range measurements data, barometer data, and the inertial measurement unit (IMU) accelerometer measurements corrupted with noise are simulated. Navigational equations, error equations, and the Kalman filter algorithm are mechanized.

AD-A016 274/3GA PC$5.75/MF$2.25
Ohio Univ Athens Dept of Electrical Engineering
Instrument Landing System Measurement Program.
Final rept. Oct 73-Apr 75.
Apr 75, 139p Rept no. EER-22-1 FAA-RD-75-153
Contract FA-74-WA-3371

Descriptors: *Instrument landings, *Antenna arrays, Glide slope, Glide path systems, Theodolites, Tracking, Performance(Engineering).
Identifiers: DOT/4IZ/ID.

Results of an extensive series of experiments to determine the characteristics and performance of the Watts slotted-cable, end-fire, glide-slope array are presented. Measurements made at the Tamiami ILS test site, specially prepared under this work program, show that the Watts array will produce a flyable path for Category I operations, but improvements are needed to give greater azimuth coverage of path information. Also, increased RF gain is needed to meet usable distance requirements when operating with solid state transmitting equipment. Image glide-slope systems and a slotted-cable localizer course array were also measured for performance characteristics and these items are discussed.

AD-A016 284/2GA PC$5.75/MF$2.25
Hughes Research Labs Malibu Calif
Hydrogen Maser Frequency Standard Systems Technology.
Final technical rept. 19 May-19 Sep 75,
A. Popa, A. Chester, W. Bridges, J. Etter, and H. Wang. Sep 75, 147p
Contract N00014-75-C-1149

Descriptors: *Navigation, *Frequency standards, Masers, Hydrogen, Atomic clocks, Navigation satellites, Position finding, Global.

Identifiers: Global positioning system, Hydrogen masers.

Space-qualified hydrogen maser atomic clocks suitable for the Global Positioning System (GPS) are reviewed in this study. Existing ground-based masers are compared in performance and failure modes. Design improvements are suggested for the components of both the physics unit and the electronics unit of a space qualifiable maser clock. Several overall design options including passive operation are compared in projected performance. Reliability and accelerated life testing procedures are discussed. A schedule for the orderly development of masers for the GPS is given.

AD-B002 301/0GA PC$3.75/MF$2.25
Atlantic Fleet, FPO New York 09501. Cruiser-Destroyer Group TWO/Destroyer Development Group.
Collision Avoidance Devices Onboard U.S. Navy Ships.
Final rept. Jul 72-Jul 74,
Jack O. Burwell, Stephen G. Kmetz, and Henry C. Debow. Feb 75, 37p CCDG2/DDG-TR-2-75
Distribution limitation now removed.

Descriptors: *Collision avoidance, *Navigational aids, *Computer applications, Radar navigation, Search radar, Digital computers, Radar targets, Course indicators, Plotters, Digital systems, Naval vessels, Safety, Onboard, Shipboard.

This report is a description and concept evaluation of the results of fleet experience with two computer aided collision avoidance devices. Four Atlantic and Pacific ships, including three 1052 class destroyer escorts, and one auxiliary service ship participated in the study. Analysis of at-sea data and observations demonstrate that the collision avoidance concept can enhance shipping safety, reduce peacetime workload of the CIC and can eliminate the need for having more than one radar repeater on the bridge.

N75-30137/4GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
The 4D Area Navigation System Description and Flight Test Results.
H. Q. Lee, F. Neuman, and G. H. Hardy. Aug 75, 59p NASA-TN-D-7874, A-5788

Descriptors: *Air traffic control, *Area navigation, *Cv-340 aircraft, *Flight tests, Digital systems, Error analysis, Flight paths, Pilot performance, Trajectory analysis.

For abstract, see STAR 1321

N75-30138/2GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
The Lognormal Frequency Distribution of a Random Data Flow.
H. P. Englmeier. Aug 75, 12p NASA-TT-F-16515
Contract NASW-2790
Tran-Transl. Into English from Nachrichtentech. Z. (West Germany), V. 28, Apr. 1975 p 115-118.

Descriptors: *Air traffic control, *Computerized simulation, *Data transmission, *Statistical distributions, Data processing, Human factors engineering, Man machine systems.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30439/4GA PC$4.25/MF$2.25
Ohio Univ., Athens. Dept. of Electrical Engineering.
A Simulation Analysis of Phase Processing Circuitry in the Ohio University omega Receiver Prototype.
M.S. Thesis.
R. A. Palkovic. Jun 75, 57p NASA-CR-132707
Contract NGR-36-009-017

Descriptors: *Computerized simulation, *Digital systems, *Omega navigation system, *Signal processing, Noise (Sound), Performance tests, Prototypes.

For abstract, see STAR 1321

PAT-APPL-574 984/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
An Integrated Inertial Reference-Inertial Navigation System.
Patent Application,
Frank W. McDonald. Filed 6 May 75, 24p Rept no.
Government-owned invention Available for licensing. Copy of application available NTIS.

Descriptors: *Inertial navigation, Patents, Inertial systems, Integrated systems, Mechanization.
Identifiers: *Patent applications, PAT-CL-244-77-B.

The patent application described and disclosed herein consists of, but is not limited to, a unique integrated inertial reference-inertial navigational system including a local-level inertial platform system, an inertially referenced gyro system, an accurate clock, accelerometers, a computer system and a device which provides data with which distance to earth's center can be computed. The basic innovation is the use of angular differences which develop between the space fixed inertial axes and the local level inertial system axes, in conjunction with clock time to solve the navigation problem. The navigational capabilities of this basic system can be enhanced by several levels of mechanization complexity; the mechanization described herein utilizes the computer to store data, provide executive control and compare data generated by the various sensors to optimize the navigational accuracy.

PATENT-3 900 847 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
Satellite Aided Vehicle Avoidance System.
Patent.
E. R. Steele. Patented 19 Aug 75, 11p PAT-APPL-219 722
Misc-Filed 21 Jan. 1972.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Collision avoidance, *Communication satellites, Doppler effect, Navigation aids, *Patents, Rangefinding, Signal transmission.
Identifiers: PAT-CL-343-6-5-R.

An improved satellite aided vehicle avoidance system is described. The exact range from a protected vehicle to an intruding vehicle with mutual collision heading and velocity is derived without signal transmission by the protected vehicle or use of synchronized time reference devices by a repeated series of signals broadcast from a satellite to all participating vehicles. An improved, reliable, and cost effective system is provided for aiding a vehicle operator to avoid collision with intruding aircraft.

17H. Optical Detection

AD-A016 230/5GA PC$9.50/MF$2.25
Teledyne Brown Engineering Huntsville Ala
The Design and Development of a Television Confirming Sensor.
Final rept.,
Sep 74, 242p NVL-EE-1829
Contract DAAK02-73-C-0365

Descriptors: *Combat surveillance, *Television systems, Battlefields, Low light levels, Image intensifiers(Electronics), Charge coupled devices, Monitors, Remote detectors, Optical detectors, Computerized simulation.
Identifiers: Charge transfer devices, REMBASS(Remotely Monitored Battlefield Sensor Systems), Remotely monitored battlefield sensor systems.

The report describes the initial objectives of the analysis, design, development, manufacture, and testing of development models of the Television Confirming Sensor for the Remotely Monitored Battlefield Sensor System Program. A summary of the activities and accomplishments of the various phases of the development program are presented. The ultimate configuration and operation of the development models are described. The analyses, design rationale, and theory of operation of the major subsystems and subassemblies are included. Changes and modifications to system concept and design are recommended which would improve the system performance and lower manufacturing costs of the Television Confirming Sensor production models.

17I. Radar Detection

AD-A015 711/5GA PC$3.75/MF$2.25
New Mexico State Univ University Park Engineering Experiment Station
Use of Wave Period in Signal Detection. Part III.
Final rept. 14 Jan 74-13 Jan 75,
Lonnie C. Ludeman, and Shun-Hon Chung. 1 Jul 75, 31p ARO-11422.4-A
Grant DAHC04-74-G-0084
See also report dated 1 Mar 75, AD-A014 949.

Descriptors: *Radar signals, *Signal processing, Radar targets, White noise, Statistical analysis.
Identifiers: *Signal detection.

An optimum receiver, wave period processor, is derived using pulse width statistical information only. Because of its complexity a suboptimum receiver, a coincidence detector, using independent samples of the wave periods is described. The performance in the form of the receiver operating characteristics of this suboptimum receiver is given for the special case of pure sinusoid plus bond-limited white Gaussian noise.

AD-A015 764/4GA PC$5.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
DAASM Project-High Latitude Aircraft HF Propagation Experiment.
Environmental research papers,
Gary S. Sales, John I. Videberg, and Rajan Varad. 19 May 75, 103p Rept nos. AFCRL-TR-75-0290, AFCRL-ERP-516

Descriptors: *Over the horizon detection, *Ionospheric propagation, Radar, High frequency, High latitudes, Power spectra, Doppler effect, Angle of arrival, Coherence, Ionosphere, Signal processing, Fourier analysis, Backscattering, Aurorae.
Identifiers: DAASM project.

The purpose of the DAASM project is to investigate the effects and limitations caused by the auroral and polar ionosphere on over-the-horizon HF propagation using a backscatter sounding system. The technique measures and records the complex amplitude of incoming, forward or backscatter signals, including noise,

at each of the 12 elements of a broadside antenna array. The data is subsequently processed using sophisticated software on a CDC-6600 computer at AFCRL. This process, using Fourier analysis techniques, provides output in the form of Doppler frequency vs arrival-angle maps as well as coherence maps.

AD-A015 815/4GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
The ARIES Program: Coordinates, Transformations, Trajectories and Tracking.
Technical note,
Bliss L. Diamond, and Michael E. Austin. 5 Sep 75, 99p Rept no. TN-1975-15 ESD-TR-75-255
Contract F19628-76-C-0002

Descriptors: *Radar tracking, Computerized simulation, FORTRAN, Radar cross sections, Radar targets, Motion, Miss distance, Interception, Coordinates, Transformations(Mathematics), Trajectories.
Identifiers: ARIES computer program, Maximum likelihood estimation.

This report presents the relations necessary to define the motion of a target in the gravitational field of the earth. In order to express this target motion in the frame of a radar, an appropriate set of coordinate systems (and transformations) is introduced. Target tracking in the form of a Maximum Likelihood Estimator is discussed. The problem of interceptor miss distance is treated from the standpoint of the uncertainty volumes associated with estimated target state vectors.

AD-A016 164/6GA PC$3.75/MF$2.25
Army Electronics Command Fort Monmouth N J
Tactical Field Demonstration of Mobile Weather Radar Set AN/TPS-41 at Fort Rucker, Alabama.
Technical rept.,
Raymond L. Robbiani. Aug 75, 28p Rept no. ECOM-5572

Descriptors: *Meteorological radar, Mobile, X band, Tactical data systems, Field tests, Storms, Clouds, Surveillance, Rainfall.
Identifiers: AN/TPS-41.

The purpose of this report is to describe the data collected by Radar Set AN/TPS-41 during a tactical field demonstration at the US Army Aviation Center, Fort Rucker, Alabama. The prime objective was to demonstrate the capability of the weather radar to support forward area airfield operations in conjunction with only that meteorological data normally provided under tactical deployment. The secondary objective was to demonstrate the mobility, rapid setup, and remote unit flexibility of the system's configuration while satisfying the requirements of a forward area weather radar system.

AD-A016 275/0GA PC$3.75/MF$2.25
Semcor Inc Riverdale Md
The Use of Frequency Agility to Achieve High Probability of Target Detection on a Single Radar Scan.
Technical rept.,
Wayne Rivers. 1 Aug 75, 28p Rept no. SD-75213-1
Contract N00024-74-C-1028

Descriptors: *Frequency agility, *Target detection, Radar, Integration, Video signals, Probability.

To achieve high probability of detection on a single scan, noncoherent integration of video signals can be more efficient than coherent integration if frequency agility is used to decorrelate the radar return pulse-to-pulse from a slowly fluctuating target. For a required detection probability of 0.9, the potential advantage from noncoherent integration of frequency-agile returns, as compared to coherent integration of the same total pulse energy on a single frequency, is about 5 dB for Swerling Case I-II targets and 2 dB for Case III-IV targets. The potential advantage is greater when higher detection probabilities are required. A strategy usable for both Swerling Case I-II and III-IV targets and P sub D values of 0.9 to 0.99 is indicated in which the burden of coherent and noncoherent integration is partitioned during the available dwell so that the number of statistically independent samples integrated after envelope detection is between 9 and 14.

PAT-APPL-505 719/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
A System to Process Antenna Beams to Obtain the Angular Location of a Target with High Resolution and Accuracy.
Patent Application,
M. C. Behnke. Filed 13 Sep 74, 19p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Radar, Patents, Target angle, Radar antennas, Antenna arrays, Signal processing, Direction finding, Accuracy, Resolution, Display systems.
Identifiers: *Patent applications, PAT-CL-343-16.

The patent application relates to a system which comprises a set of 16 antennas disposed so that their beams overlap to cover completely some sector of area; a mixing system to provide a plurality of I.F. signals; a first detector for each I.F. signal which applies this signal to a comparison and display system which determines and their displays which of the I.F. signals has the strongest amplitude; a second detector for each I.F. signal which applies this signal to a circuit which combines the plurality of I.F. signals into two sine-waves, these two sine-waves being applied to the vertical and horizontal deflection plates of an oscilloscope. The oscilloscope display expands the azimuth target travel to traverse each of the 16 beams from 2 degrees to 90 degrees. Thus the target location within a particular beam can be determined very accurately. The light display indicates which particular beam is being traversed at any particular time.

PAT-APPL-573 699/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Battlefield IFF System.
Patent Application,
M. J. Prichett, and Bernarr H. Humphreys. Filed 1 May 75, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *IFF systems, Patents, Battlefields, Transponders, Manportable equipment, Radar equipment.
Identifiers: *Patent applications, PAT-CL-343-6-5.

The patent application describes a battlefield identification friend or foe (BIFF) system comprising a radar unit including a switch for selectively connecting an interrogation encoder to the modulator of a radar unit and a response decoder also located at the radar site. At a remote station is a transponder which includes an interrogation decoder which, when properly interrogated, activates the transponder/transmitter which then transmits a coded response message.

17J. Seismic Detection

AD-A015 650/5GA PC$3.75/MF$2.25
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
Short Period Signal-to-Noise Ratio at NORSAR.
Technical rept.,
Robert R. Blandford. 7 Aug 74, 37p Rept no. SDAC-TR-74-13
Contract F086-74-C-0006, ARPA Order-1620

Descriptors: *Seismic detection, *Seismic arrays, *Underground explosions, Earthquakes, Signal to noise ratio, Nuclear explosions, Intensity, Beam steering, Tables(Data), Norway.
Identifiers: Vela Uniform, Short period seismometers, *Norwegian seismic array, *Seismic discrimination.

Analysis of nine events recorded by the NORSAR short-period array reveals that a beam of the ten Northeast subarrays has only .06 magnitude units less detection capability than the full array and that the 3C subarray has only .18 magnitude units less capability. The study shows that if the 3C subarray were expanded to 56 elements inside a 15 km diameter circle it would have .3 magnitude units more detection capability than the present full array.

AD-A015 651/3GA PC$3.75/MF$2.25
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
Q for 20-Second Rayleigh Waves from Complete Great-Circle Paths.
Technical rept.,
D. H. von Seggern. 27 Feb 75, 31p Rept no. SDAC-TR-75-3
Contract F08606-74-C-00066, ARPA Order-1620

Descriptors: *Seismic detection, *Earthquakes, *Rayleigh waves, Seismometers, Seismic arrays, Amplitude, Predictions, Signal processing, Nuclear explosions, Surface waves, Ratios, Seismic waves.
Identifiers: *Seismic discrimination Vela Uniform.

Seismograms of carefully selected large earthquakes recorded on the high-gain, long-period network were used to visually determine the amplitude ratio of 20-second Rayleigh waves in the R sub 1 and R sub 3 phases. Identification of R sub 3 was aided by applying a time-varying processor which discriminates heavily against ground motion other than the R sub 3 signal. Ratios were determined in 29 cases representing diverse great circles over the earth; and the average Q estimated for the 20-second, fundamental-mode Rayleigh waves was 498. This value is relevant to distance-amplitude corrections routinely made in M sub s calcualtions and is significantly greater than that Q implied by the current (1.66.) log delta relation. Our data did not reveal any significant difference in attenuation over oceanic and continental structures for 20-second Rayleigh waves.

AD-A015 761/0GA PC$4.75/MF$2.25
Texas Instruments Inc Dallas Equipment Group
VELA Network Evaluation and Automatic Processing Research.
Final rept.,
William H. Swindell. 31 Dec 74, 96p Rept no. TI-ALEX(01)-FR-74-02
Contract F08606-74-C-0033, ARPA Order-2551
See also report dated 15 Nov 74, AD-A003 676.

Descriptors: *Seismic detection, *Underground explosions, Earthquakes, Seismometers, Nuclear explosions, Signal to noise ratio, Epicenters, Signal processing, Statistical analysis, Seismological stations, Seismic waves, Alaska, Norway.
Identifiers: Vela Uniform, *Seismic discrimination, Alaska long period array, Norwegian seismic array, Long period seismometers, Seismic noise.

Work performed on Contract F08606-74-C-0033 has been reported in detail in a series of four-

teen technical reports. This final report summarizes the material covered in each of the technical reports and discusses the conclusions obtained. The five tasks in the program included a final evaluation of the Very Long Period Experiment (VLPE) stations and an evaluation of the detection and discrimination capabilities of a seismic network composed of VLPE stations and the VELA period arrays in Alaska (ALPA) and Norway (NORSAR). The other tasks were studies concerning techniques for signal detection and signal estimation, discrimination methods for first-zone events, and various analyses of a future worldwide seismic surveillance system.

AD-A015 969/9GA PC$4.75/MF$2.25
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
Character of Vertical-Component Signals at High-Gain, Long-Period Stations and Signal Interference on Seismic Detection Networks.
Technical rept.,
D. H. von Seggern, and M. F. Tillman. 21 Jul 75, 86p Rept no. SDAC-TR-75-1
Contract F08606-74-C-0006, ARPA Order-1620

Descriptors: *Seismic detection, *Underground explosions, Seismological stations, Measurement, Earthquakes, Nuclear explosions, Interference, Seismic waves, High gain, Simulation, Flow charting, Epicenters, Tables(Data), Graphs.
Identifiers: Vela Uniform, *Seismic coda, *Seismic discrimination, Long period seismometers.

The amplitude and period of over 600 long-period vertical-component seismic signals were measured at regular intervals in order to characterize the LR signal and its coda. Signal envelopes out to 20 minutes after LR onset were found to vary considerably, but coda amplitudes decayed rather uniformly with time. Using average signal and coda parameters and randomly-generated events, a program which simulates long-period signal interference at seismic stations was devised to predict interference effects on network detection statistics. Increasing the size of a network should not increase the number of reported events with interference at any M sub s, but lowering the station thresholds will increase this number at lower M sub s values.

AD-A016 058/0GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Worldwide Detection Capability of a Prototype Network of Seismograph Stations.
Technical note,
Russell E. Needham. 19 Aug 75, 38p Rept no. TN-1975-42 ESD-TR-75-250
Contract F19628-76-C-0002, ARPA Order-512

Descriptors: *Seismic detection, *Seismic data, *Underground explosions, Seismological stations, Earthquakes, Nuclear explosions, Intensity, Epicenters, Probability, Global, Mathematical models.
Identifiers: *Seismic discrimination.

An investigation into the detection capability of a prototype seismic network has been completed. This investigation was threefold in nature. The first investigation was a comparison of event lists; second, the effect of careful reading of seismograms was determined; and, finally, a simple statistical model was programmed to predict the probability of an N-station detection from an M-station network with a known average station probability.

AD-A016 246/1GA PC$6.25/MF$2.25
Rand Corp Santa Monica Calif
Soviet Seismographic Stations and Seismic Instruments. Part II.
Interim rept.,
C. Shishkevish. Jun 75, 168p Rept no. R-1647-ARPA
Contract DAHC15-73-C-0181, DARPA Order-189-1
See also AD-787 052.

Descriptors: *Seismological stations, *Seismometers, *Seismic detection, *USSR, Reviews, Construction, Galvanometers, Amplifiers, Recording systems, Seismographs, Seismic arrays, Nuclear explosions, Instrumentation, Computers, Networks.
Identifiers: Design.

This report deals mainly with seismic instruments and components developed since 1960. It covers short-period and intermediate-band seismographs and includes detailed descriptions of seismometers, galvanometers, amplifiers, recording systems, and the best known seismograph systems formed by combining these components; long-period instruments; special seismograph station networks; short-to-intermediate period and long-period, multiple band-pass, spectral analyzing seismographs consisting of a seismometer, a variable-gain, broadband amplifier, band-pass channel filters, and a light-beam oscillograph; strainmeters; and time-service equipment, magnetic drum recorders, and analog-to-digital converters.

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

BNL-20241 PC$4.50/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Production and Use of Li(D,N) Neutrons for Simulation of Radiation Effects in Fusion Reactors.
A. N. Goland, D. H. Gurinsky, J. Hendrie, J. Kukkonen, and T. Sheehan. 1975, 29p CONF-750723-3

Descriptors: (*Neutron sources, *Materials testing), (*Thermonuclear reactor materials, Materials testing), Aluminium, Deuteron beams, Gold, Lithium, Neutrons, Niobium, Physical radiation effects, Simulation.

For abstract, see NSA 32 08, number 19481.

BNL-20263 PC$4.25/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Preliminary Design of a 30-Mev Deuteron Linear Accelerator for the Production of Intense BEAMS of High Energy Neutrons for Ctr Research.
K. Batchelor, J. P. Blewett, R. Chasman, J. Claus, and N. Fewell. 1975, 23p CONF-750723-4

Descriptors: (*Neutron sources, *Design), (*Thermonuclear reactor materials, *Materials testing), Deuteron beams, Linear accelerators, Lithium.

For abstract, see NSA 32 08, number 19482.

CEA-CONF-3046 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
First Results on Petula Tokamak.
R. Bardet, M. Bernard, and G. Briffod. 1975, 4p CONF-750905-12
U.S. Sales Only.

Descriptors: (*Tokamak devices, *Operation), Electron density, Electron temperature, Magnetic fields, Shells.

For abstract, see NSA 32 08, number 19483.

CEA-CONF-3050 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Filamentation Instability of an Ion--Sound Wave.
E. Canobbio. 1975, 4p CONF-750905-14
U.S. Sales Only.

Descriptors: (*Plasma waves, Ion acoustic waves), (*Ion acoustic waves, *Wave propagation), Homogeneous plasma, Plasma confinement, Plasma heating, Plasma instability.

For abstract, see NSA 32 08, number 19517.

CEA-CONF-3051 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Extraction of Impurities from a Tokamak.
T. Consoli, R. Legardeur, and G. F. Tonon. 1975, 4p CONF-750905-15
U.S. Sales Only.

Descriptors: (*Tokamak devices, Divertors), (*Divertors, *Performance), Atoms, Impurities, Ions, Limiters, Plasma density.

For abstract, see NSA 32 08, number 19484.

CONF-750905-5 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Extension of Confinement and Neutral Injection Experiments in Ormak to Higher Parameters.
J. F. Lyon. 1975, 4p

Descriptors: (*Ormak devices, *Operation), Beam injection heating, Efficiency, Impurities, Magnetic fields, Neutral atom beam injection, Plasma confinement, Research programs.

For abstract, see NSA 32 08, number 19485.

COO-2007-59 PC$4.00/MF$2.25
Illinois Univ., Urbana.
Laser-Pellet Fusion by Energy Feedback to a Direct Nuclear Pumped Auxiliary Laser.
W. E. Wells. May 75, 19p CONF-750531-7

Descriptors: (*Lasers, *Excitation), (*Thermonuclear reactors, *Laser implosions), Laser-produced plasma, Neutron reactions.

For abstract, see NSA 32 08, number 19486.

COO-2218-09 PC$4.75/MF$2.25
Illinois Univ., Urbana.
Summary of a Meeting on Non-Electrical Energy Extraction from Fusion Reactors at AEC Germantown Headquarters, March 20, 1973.
G. H. Miley. 20 Jul 73, 35p

Descriptors: (*Thermonuclear reactors, *Energy transfer), Bremsstrahlung, Charged particles, Cyclotron radiation, Neutrons, Radiations, Thermonuclear reactions, X radiation.

For abstract, see NSA 32 08, number 19487.

COO-3028-18 PC$4.00/MF$2.25
Princeton Univ., N.J. Dept. of Chemical Engineering.
Studies in Fusion Reactor Technology. Progress Report, September 1, 1974--May 30, 1975.
R. C. Axtmann, H. K. Perkins, C. H. Kuehler, and J. D. Fish. 1975, 7p
Contract AT(11-1)-3028

Descriptors: (*St tokamak, *Research programs), (*Ion sources, *Performance testing), Hydrogen ions 1 plus, Operation, Permeability, Stainless steels.

For abstract, see NSA 32 08, number 19488.

ERDA-tr-50 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
Chemical Atomization of Graphite by H exp + Ions.
I. P. Busharov, E. A. Gorbatov, V. M. Gusev, M. I. Guseva, and Yu. V. Martynenko. 1975, 10p
Translation of Khimicheskoe raspylenie grafita ionami.

Descriptors: (*Thermonuclear reactor walls, *Sputtering), (*Graphite, Sputtering), Hydrogen ions 1 plus, Irradiation, Molecules.

For abstract, see NSA 32 08, number 19489.

IPP-4/130 PC$6.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Preliminary Model for Estimating the First Wall Lifetime of a Fusion Reactor.
W. Daenner. Feb 75, 58p
U.S. Sales Only.

Descriptors: (*Thermonuclear reactor walls, *Lifetime), (*Thermonuclear reactor materials, Lifetime), Breeding blankets, Creep, Mathematical models.

For abstract, see NSA 32 08, number 19490.

LA-UR-75-1032 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Electrical Breakdown and Tracking Characteristics of Pulsed High Voltages in Cryogenic Helium and Nitrogen.
R. A. Haarman, and K. D. Williamson, Jr.. 1975, 16p CONF-750716-7
Contract W-7405-ENG-36

Descriptors: (*Scyllac devices, *Specifications), (*Dielectric materials, *Breakdown), Cryogenics, Electric potential, Electrical insulation, Helium, Nitrogen, Superconducting magnets.

For abstract, see NSA 32 08, number 19495.

LA-UR-75-736 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Engineering Concepts for Laser-Fusion Reactor Applications.
L. A. Booth, T. G. Frank, and F. T. Finch. 1975, 18p CONF-750812-2
Contract W-7405-ENG-36

Descriptors: (*Laser implosions, *Planning), (*Laser-produced plasma, Planning), (*Thermonuclear reactors, Planning), Economics, Engineering, Microspheres, Thermonuclear fuels.

For abstract, see NSA 32 08, number 19493.

LA-UR-75-864 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Stability and Temperature Measurements on Zt-1.
D. A. Baker, L. C. Burkhardt, and J. N. Di Marco. 1975, 5p CONF-750905-3
Contract W-7405-ENG-36

Descriptors: (*Toroidal theta pinch devices, *Magnetic fields), Doppler effect, Line broadening, Scaling laws, Stability, Temperature measurement.

For abstract, see NSA 32 08, number 19494.

LA-6032-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Ltpf: A Linear theta-Pinch Neutron Source.
W. R. Ellis. Jul 75, 44p

Descriptors: (*Linear theta pinch devices, Neutron sources), (*Neutron sources, *Design), Magnetic mirrors, Neutrons, Thermonuclear reactions.

For abstract, see NSA 32 08, number 19492.

MATT-1149 PC$4.75/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Mhd Theory of Divertors Without Viscosity.
A. H. Boozer. Jul 75, 32p
Contract AT(11-1)-3073

Descriptors: Divertors, Electrons, Ions, Magnetohydrodynamics, Plasma, Viscosity.

For abstract, see NSA 32 08, number 19496.

ORNL-TM-4818 PC$5.75/MF$2.25
Oak Ridge National Lab., Tenn.
Magnetohydrodynamics Test of a One-Sixth Scale Model of a Ctr Recirculating Lithium Blanket.
F. J. Young, R. S. Holcomb, and A. P. Fraas. Aug 75, 53p
Contract W-7405-eng-26

Descriptors: (*Breeding blankets, *Magnetohydrodynamics), Laminar flow, Lithium, Mockup, Reynolds number, Thermonuclear reactors.

For abstract, see NSA 32 08, number 19498.

ORNL-TM-4941 PC$10.75/MF$2.25
Oak Ridge National Lab., Tenn.
Research Program for Plasma Confinement and Heating in Elmo Bumpy Torus Devices.
R. A. Dandl, R. A. Dory, and H. O. Eason. Jun 75, 155p
Contract W-7405-eng-26

Descriptors: (*Elmo bumpy torus, *Planning), Plasma confinement, Plasma heating, Plasma instability, Research programs.

For abstract, see NSA 32 08, number 19499.

ORNL-tr-2988 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany). Experimentelle Plasmaphysik 4.
First Startup of the Siemens SI Prototype Magnets W VII in the Ipp.
W. Amenda, D. Kullmann, P. Krueger, and M. Pillsticker. Aug 74, 15p
Translation by R.G. Mansfield of IPP--4/120.

Descriptors: (*W stellarators, *Superconducting magnets), Mechanical properties, Niobium alloys, Stresses, Titanium alloys.

For abstract, see NSA 32 08, number 19500.

SAND-75-5537 PC$4.00/MF$2.25
Sandia Labs., Livermore, Calif.
Target Irradiation Studies Using Relativistic Electron BEAMS.
M. J. Clauser, J. R. Freeman, G. R. Hadley, J. A. Halbleib, and J. G. Kelly. 1975, 7p CONF-750905-7

Descriptors: (*Plasma production, *Electron beams), (*Thermonuclear fuels, *Compression), Energy transfer, Irradiation, Relativistic beam injection.

For abstract, see NSA 32 08, number 19501.

UCRL-13640(App.) PC$11.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Laser Fusion Systems Design Study. Final Technical Report.
Jun 75, 172p

Descriptors: (*Lasers, *Research programs), (*Thermonuclear reactors, *Laser implosions), Design, Laser mirrors, Laser-produced plasma, Optical systems, Specifications.

For abstract, see NSA 32 08, number 19503.

UCRL-51749 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Studies of Radiation Blistering Effects on Voltage Holding.
G. H. Miley. 31 Mar 75, 44p
Contract W-7405-Eng-48

Descriptors: (*Thermonuclear reactor materials, *Swelling), (*Niobium, Swelling), (*Tungsten, Swelling), Breakdown, Electric currents, Electric potential, Helium ions, Physical radiation effects, Thermonuclear reactors.

For abstract, see NSA 32 08, number 19504.

UCRL-76562 PC$4.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Computer Applications in Controlled Fusion Research.
J. Killeen. Feb 75, 23p CONF-750808-1

Descriptors: (*Thermonuclear devices, *Data acquisition systems), Computer calculations, Computers, Data processing.

For abstract, see NSA 32 08, number 19505.

UCRL-76896 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Repetitively Pulsed Material Testing Facility.
O. Zucker, W. Bostick, R Gullickson, J. Long, and J. Luce. 12 Aug 75, 20p CONF-750518-3

Descriptors: (*Thermonuclear reactor materials, *Materials testing), (*Plasma focus devices, *Neutrons), Neutron sources, Performance.

For abstract, see NSA 32 08, number 19506.

UCRL-77021 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Test Results of a 27 cm Bore Multifilamentary NB sub 3 SN Solenoid.
J. P. Zbasnik, R. L. Nelson, D. N. Cornish, and C. E. Taylor. 17 Jul 75, 14p CONF-750710-4

Descriptors: (*Superconducting magnets, *Performance testing), Intermetallic compounds, Niobium alloys, Strains, Tin alloys.

For abstract, see NSA 32 08, number 19502.

18B. Isotopes

CONF-750210- PC$5.45/MF$2.25
Energy Research and Development Administration, Washington, D.C. Div. of Production and Materials Management.
Uranium Enrichment Conference for Foreign Contractors, Oak Ridge, Tennessee, February 28, 1975, Oak Ridge, Tennessee, February 28, 1975.
1975, 87p

Descriptors: (*Uranium 235, *Isotope separation), (*Gaseous diffusion plants, *Meetings), Operation, Planning.

For abstract, see NSA 32 08, number 19845.

CONF-750913-1 PC$4.00/MF$2.25
Tennessee Univ., Knoxville Dept. of Chemistry.
Preparation and Study of Elemental Californium-249.
M. Noe, and J. R. Peterson. 1975, 8p

Descriptors: (*Californium 249, *Crystal lattices), Chemical preparation, Chemical state, Isotope production, Temperature dependence, X-ray diffraction.

For abstract, see NSA 32 08, number 19401.

KFK-2142 PC$6.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Kernverfahrenstechnik.
Consequences and Counteractions in Case of Failure of a Stage Compressor in a Separation Nozzle Cascade for exp 235 U-Enrichment.
W. Fritz, R. Schaefer, and R. Schuette. May 75, 59p
In German. U.S. Sales Only.

Descriptors: (*Uranium 235, *Isotope separation), (*Separation nozzle method, *Compressors), Diffusion, Efficiency, Failures, Operation, Uranium hexafluoride.

For abstract, see NSA 32 08, number 19846.

PATENT-3 899 680 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Protected Isotope Heat Source.
Patent.
R. K. Burns, L. I. Shure, and E. D. Katzen.
Patented 12 Aug 75, 5p PAT-APPL-146 939
Misc-Filed 26 May 1971 Supersedes N71-35153 (9 - 21, p 3530).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Cases (Containers), *Heat sources, *Heat transmission, *Radioactive isotopes, *Reentry shielding, Aerodynamic characteristics, Graphite, *Patents, Systems engineering.
Identifiers: PAT-CL-250-496.

A radioactive isotope capsule is disposed in a container (heat shield) which will have a single stable trim attitude when reentering the earth's atmosphere and while falling to earth. The center of gravity of the heat source is located forward of the midpoint between the front face and the rear face of the container. The capsule is insulated from the front face of the container but not from the rear surface of the container.

UCRL-76923 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Separation of Uranium Isotopes by Selective Photoionization.
B. B. Snavely, R. W. Solarz, and S. A. Tuccio. 27 May 75, 9p CONF-750653-1

Descriptors: (*Uranium 235, *Laser isotope separation), (*Uranium, *Autoionization), Dye lasers, Gas lasers, Photoionization.

For abstract, see NSA 32 08, number 19847.

18C. Nuclear Explosions

AD-A015 667/9GA PC$3.75/MF$2.25
Mission Research Corp Santa Barbara Calif
A Radiation Diffusion and Hydrodynamics Code for Low-Altitude Multiple Bursts.
Topical rept. 1 Apr 72-30 Sep 73,
Robert E. Stoeckly. 15 Jul 75, 38p Rept no. MRC-R-77 DNA-3282T
Contract DNA001-75-C-0142

Descriptors: *Nuclear explosions, *Hydrodynamic codes, Nuclear radiation, Computerized simulation, Nuclear fireball, Low altitude, Airburst, Multiple operation, Sequential, Two dimensional, Energy transfer, Diffusion, Differential equations, Thermodynamics, Equilibrium(General), Thermal radiation, Heat transfer, X rays, Deposition, Opacity, Air, Equations of state, Difference equations.
Identifiers: Multibursts, Early time models, Late time models, Local thermodynamic equilibrium, Mice hydrodynamic code.

This paper describes a computer code for studying strongly interacting multiple air bursts at low altitude. It is designed to study both early and late phases of two (or more) nonsimultaneous bursts at different positions along a vertical line. The code -- a two-dimensional modification of the one-fluid, implicit, Eulerian hydrodynamic code MICE -- treats radiative energy transfer in the approximation of radiation diffusion (or local thermodynamic equilibrium). This modification also treats in a rudimentary way the loss of thermal radiation from fireballs: this is calculated by using Planck mean opacities for one frequency interval to integrate the optical depth from each cell to infinity in several directions. These treatments complement one another in the sense that the radiation diffusion transfers radiant energy during a time step from each cell to the immediately adjacent cells, while the radiation loss term transfers radiant energy from each cell to infinity. The difference equations involve (further) use of the technique of time-step splitting and are implicit. The relations used for the equations of state and the Rosseland and Planck mean opacities of air are plotted, and the method for initial X-ray deposition is described. To get satisfactory results, the radiation loss rate has been artifically increased to force the correct total radiation loss.

AD-A015 946/7GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
The Kelvin-Helmholtz Instability and Turbulent Mixing.
Memorandum rept.,
J. P. Boris, T. P. Coffey, and S. Fisher. Sep 75, 14p Rept no. NRL-MR-3125

Descriptors: *Nuclear explosions, *Turbulent flow, *Nuclear fireball, *Computerized simulation, Low altitude, Compressible flow, Mixing, Hydrodynamic codes, Growth(General), Instability, Saturation, Amplitude, Perturbations, Eigenvectors, Long wavelengths, Linearity, Entrainment, Differential equations, Numerical analysis.
Identifiers: *Kelvin-Helmholtz instability, *Shear profiles, SHAS 2D hydrodynamic code.

Detailed two-dimensional simulations of the Kelvin-Helmholtz instability in a compressible fluid have been carried out to study several microscopic aspects of turbulent entrainment and mixing occurring in low altitude nuclear explosions. The numerical simulations, performed by the SHAS2D computer code, treat accurately the three important regimes: (1) Linear growth of the unstable modes, (2) Quasi-linear saturation of these unstable modes by shear-layer broadening, and (3) Shear-flow mixing of the large amplitude perturbations. A dispersion-relation code has been developed to study the unstable spectrum in the linear regime for arbitrary sheared-flow profiles and sound-speed profiles. This involves solving an inhomogeneous eigenvalue problem and has shown qualitative differences between the low Mach number problem and the incompressible problem. Using the results of the linear analysis and the numerical simulation for nonlinear effects, a phenomenological mixing model has been developed for the cascade of wave energy to long wavelengths via mode coupling and quasi-linear stabilization of the shorter wavelengths. (Author)

AD-A016 260/2GA PC$3.75/MF$2.25
R and D Associates Marina Del Rey Calif
EMP Generation Near Objects with Cylindrical Symmetry in the Source Region.
Topical rept.,
Charles Tse Chin Mo. 19 Jun 75, 42p Rept no. RDA-TR-5900-002 DNA-3602T
Contract DNA001-74-C-0139

Descriptors: *Nuclear explosions, *Electromagnetic pulses, Bodies of revolution, Cylindrical bodies, Compton scattering, Magnetic fields, Computer applications.
Identifiers: RONDINE computer program, ONDINE computer program.

Large electromagnetic fields and currents can be induced on an object immersed in the EMP source region of a near-surface nuclear explosion. If the object is a body of revolution with length much larger than the skin depth of the EMP environment, it can be treated as if it were cylindrical. Solved is such a circular cylindrical source region problem with the incident photons parallel to the cylindrical axis, having negligible attenuation, and encountering no environmental changes along the axis in the region of interest, by analysis and by a numerical code RONDINE which is obtained by slightly modifying the planar code ONDINE. The RONDINE is applicable to any circular cylindrical, stratified source region problem. In particular, the results for a conducting wire in the source region are obtained from RONDINE and are calculated from analysis. They are compared and exhibit very good agreement. In addition, the effect of magnetic field turning on Compton electrons is investigated and found to substantially reduce the current on the wire.

UCID-16810 PC$4.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Distortion in Simulated alpha and Fwhm Measurements on OS-40 Oscilloscopes Linked in Series.
T. L. Harper. 6 Jun 75, 26p
Contract W-7405-Eng-48

Descriptors: (*Nuclear explosions, *Data acquisition), (*Oscillographs, *Performance testing), Data acquisition systems, Simulation, Time resolution, Underground explosions.

For abstract, see NSA 32 08, number 19837.

UCRL-51834 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Hybla Fair Event: Environmental Report.
D. R. Roach, and W. L. Russell, Jr.. 30 May 75, 14p
Contract W-7405-Eng-48

Descriptors: (*Pressure gages, *Performance), (*Accelerometers, Performance), (*Strain gages, Performance), (*Thermocouples, Performance), Measuring instruments, Nuclear explosions, Pipes, Temperature measurement, Transducers, Underground explosions.

For abstract, see NSA 32 08, number 19674.

18D. Nuclear Instrumentation

ANL/HFEF-006 PC$5.50/MF$2.25
Argonne National Lab., Idaho Falls, Idaho.
Plutonium Contamination Monitoring in the Hfef Hot Cells During Sectioning of Mark-Iia Sodium Loops.
J. H. Cook, R. Villarreal, C. E. Holson, and J. F. Kerr. May 75, 48p
Contract W-31-109-Eng-38

Descriptors: (*Hot cells, *Radiation monitoring), Contamination, Plutonium, Sodium, Test facilities.

For abstract, see NSA 32 08, number 19678.

CEA-CONF-3089 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
Isotopic Separation and the Performances of a Slowing down Arrangement in a Beam of High Energy Heavy Nuclei.
M. Cantin, P. Goret, and J. Jorrand. 1975, 6p
CONF-750805-4
U.S. Sales Only.

Descriptors: (*Cosmic ray detection, Cherenkov counters), (*Cherenkov counters, *Resolution), (*Primary cosmic radiation, *Isotope ratio), Ion detection, Lead, Nitrogen ions, Nitrogen 14, Oxygen ions, Oxygen 16, Performance.

For abstract, see NSA 32 08, number 19816.

IEA-359 PC$4.00/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
Automated gamma -- Gamma Angular Correlation Spectrometer.
R. N. Saxena, N. T. S. Monteiro, and A. B. Nuevo, Jr.. Oct 74, 16p
In Portuguese. U.S. Sales Only.

Descriptors: (*Gamma spectrometers, *Design), (*Nickel 60, *Gamma cascades), (*Arsenic 75, Gamma cascades), (*Tantalum 181, Gamma cascades), Angular correlation, Bromine 81.

For abstract, see NSA 32 08, number 19812.

JUL-1162 PC$5.75/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Festkoerperforschung.
Analysis of Molecular Motion with the SV5-C Neutron Spectrometer at the Frj-2.
R. Stockmeyer. Feb 75, 52p
In German. U.S. Sales Only.

Descriptors: (*Hydrogen 1, *Chemisorption), (*Adamantane, *Orientation), Catalysts, Neutron spectrometers, Temperature dependence, Time-of-flight spectrometers.

For abstract, see NSA 32 08, number 19813.

RL-75/044 PC$4.75/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Observations and Measurements with Drift Chambers at the Rutherford Laboratory.
J. E. Bateman, and J. F. Connolly. Feb 75, 34p
U.S. Sales Only.

Descriptors: (*Drift chambers, *Design), Performance, Spatial resolution, Specifications.

For abstract, see NSA 32 08, number 19821.

RT/EL-(75)1 PC$4.25/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Digital Memory for Television Images.
C. Paretti. Jan 75, 24p
In Italian. U.S. Sales Only.

Descriptors: (*Television, *Memory devices), (*Nuclear emulsions, *Readout systems), (*Image scanners, Memory devices), Digital systems, Filters, Images, Personnel monitoring.

For abstract, see NSA 32 08, number 19800.

18E. Nuclear Power Plants

AAEC/E-345 PC$4.50/MF$2.25
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
Analysis of Power Transients Observed in Spert I Reactors. Part I. Transients in Aluminium Plate-Type Reactors Initiated at Ambient Temperature.
B. E. Clancy, J. W. Connolly, and B. V. Harrington. Mar 75, 28p
U.S. Sales Only.

Descriptors: (*Spert-1 reactor, *Excursions), Boiling, Feedback, Reactivity, Reactor cores, Reactor kinetics, Simulation, Transients, Void coefficient.

For abstract, see NSA 32 08, number 21522.

AECL-5106 PC$5.25/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
Interpreting Failure Data in a Nuclear Plant by the Hazard Function.
W. A. Wolfe. Apr 75, 42p CONF-750416-3
U.S. Sales Only.

Descriptors: (*Pickering-1 reactor, *Pumps), (*Pickering-2 reactor, Pumps), (*Pickering-3 reactor, Pumps), (*Pickering-4 reactor, Pumps), Failures, Reactor cooling systems, Reliability, Seals.

For abstract, see NSA 32 08, number 21474.

CE-ƏNL-BIB-5(Rev.1) PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Candu Reactor System: A Bibliography, 1967--December 1974.
F. A. Hitchings. Apr 75, 19p
U.S. Sales Only.

Descriptors: (*Canada, Phwr type reactors), (*Phwr type reactors, *Bibliographies), Nuclear power plants.

For abstract, see NSA 32 08, number 21475.

CONF-750607-24 PC$4.00/MF$2.25
Westinghouse Electric Corp., Baltimore, Md.
Status of the Clinch River Breeder Reactor Plant Nuclear Steam Supply System.
W. M. Jacobi. 6p

Descriptors: (*Clinch river breeder reactor, *Design), Planning, Reviews.

For abstract, see NSA 32 08, number 21489.

CONF-750804-6 PC$4.00/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
Natural Circulation Cooling of Fftf Closed Loop Test Sections During Removal from Reactor.
R. D. Coffield, and J. V. Miller. Oct 74, 16p
Contract AT(45-1)-2171

Descriptors: (*Fftf reactor, *Fuel assemblies), Cooling, Natural convection, Reactor fueling.

For abstract, see NSA 32 08, number 21523.

CONF-750810-1 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Investigation of Two-Phase Liquid-Metal Magnetohydrodynamic Power Systems.
W. E. Amend, G. Fabris, and J. Cutting. 1975, 14p
Contract W-31-109-eng-38

Descriptors: (*Liquid-metal mhd generators, *Efficiency), (*Lmfbr type reactors, Liquid-metal mhd generators), (*Htgr type reactors, Liquid-metal mhd generators), (*Thermonuclear reactors, Liquid-metal mhd generators), Bottoming cycles, Coal, End effects, Energy losses, Energy sources, Fluidized-bed combustion, Heat flow, Heat transfer, Magnetohydrodynamics, Mathematical models, Nitrogen, Performance testing, Potassium, Sodium, Steam turbines, Test facilities, Thermal efficiency, Thermodynamic cycles, Two-phase flow.

For abstract, see NSA 32 08, number 21490.

CONF-750812-10 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Temperature Control with High Performance Gravity-Assist Heat Pipes.
J. E. Kemme, J. E. Deverall, E. S. Keddy, J. R. Phillips, and W. A. Ranken. 1975, 6p
Contract W-7405-ENG-36

Descriptors: (*Ebr-2 reactor, *Reactor experimental facilities), (*Heat pipes, *Design), Performance, Potassium, Sodium, Temperature control.

For abstract, see NSA 32 08, number 21524.

CONF-750812-3 PC$4.25/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
Clinch River Breeder Reactor Plant.
G. W. Hardigg. 25p

Descriptors: (*Clinch river breeder reactor, *Design), Planning, Reviews.

For abstract, see NSA 32 08, number 21491.

COO-2245-20TR PC$5.45/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Nuclear Engineering.
Prediction of Coolant Temperature Field in a Breeder Reactor Including Interassembly Heat Transfer.
B. C. J. Chen, and N. E. Todreas. May 75, 133p
Contract AT(11-1)-2245

Descriptors: (*Lmfbr type reactors, Fuel assemblies), (*Clinch river breeder reactor, Fuel assemblies), (*Fuel assemblies, *Temperature distribution), Heat transfer, Mathematical models, Reactor cooling systems, S codes.

For abstract, see NSA 32 08, number 21492.

COO-2245-22TR PC$5.45/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Nuclear Engineering.
Turbulent Momentum Exchange Coefficients for Reactor Fuel Bundle Analysis.
H. Ninokata, and N. E. Todreas. Jun 75, 89p
Contract AT(11-1)-2245

Descriptors: (*Lmfbr type reactors, Fuel element clusters), (*Fuel element clusters, *Fluid flow), Fuel pins, Linear momentum transfer, Mathematical models, Turbulent flow, V codes.

For abstract, see NSA 32 08, number 21493.

DP-1367 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Method of Analysis to Determine Subcritical Reactivity from the Pulsed Neutron Experiment.
P. B. Parks. Jun 75, 43p
Contract AT(07-2)-1

Descriptors: (*Subcritical assemblies, *Reactivity), (*Pulsed neutron techniques, *Comparative evaluations).

For abstract, see NSA 32 08, number 21526.

EIR-251-2 PC$7.25/MF$2.25
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).

Study of the exp 17 F Activity as a Nuclear Power Monitor at the Heavy Water Reactor Diorit. Part II. Measurement Installation.
K. Behringer, B. Leoni, and H. S. Pruys. Feb 74, 84p
In German. U.S. Sales Only.

Descriptors: (*Diorit reactor, Reactivity meters), (*Reactivity meters, *Performance), (*Activation detectors, Performance), Fluorine 17, Neutron flux, Response functions.

For abstract, see NSA 32 08, number 21527.

EUR-5284e PC$8.00/MF$2.25
Didier (J.M.) and Associates, Brussels (Belgium).
Authorization Procedure for the Construction and Operation of Nuclear Installations within the Eec Member States.
1974, 96p
U.S. Sales Only.

Descriptors: (*European communities, *Reactor licensing), (*Nuclear facilities, *Licensing), (*Nuclear power plants, Reactor licensing), Construction, Operation.

For abstract, see NSA 32 08, number 21751.

EUR-5312e PC$7.75/MF$2.25
Commission of the European Communities, Petten (Netherlands). Joint Nuclear Research Center.
High Flux Materials Testing Reactor (Hfr) Petten. Annual Report, 1973.
1974, 92p
U.S. Sales Only.

Descriptors: (*Hfr reactor, *Reactor experimental facilities), Irradiation capsules, Reactor operation, Research programs.

For abstract, see NSA 3208

GA-A-13276 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Preirradiation Report HT-28 and HT-29.
W. J. Kovacs, and D. P. Harmon. 13 Jun 75, 37p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Performance testing), Coatings, Thickness, Thorium oxides.

For abstract, see NSA 32 08, number 21465.

GA-A-13298 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Postirradiation Examination of Charcoal Trap in Irradiation Capsule Gb-9.
S. Langer, G. Buzzelli, and P. W. Flynn. 28 May 75, 40p
Contract AT(04-3)-167

Descriptors: (*Gcfr type reactors, Fuel elements), (*Fuel elements, *Traps), Charcoal, Fission products, Performance testing.

For abstract, see NSA 32 08, number 21494.

GA-A-13319 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Evaluation of Corrosion: Inhibiting Compounds for the Protection of Prestressing Systems.
J. F. Hildebrand. 14 Feb 75, 6p CONF-750906-1
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Pressure vessels), Corrosion inhibitors, Inspection, Performance, Wires.

For abstract, see NSA 32 08, number 21466.

GA-A-13383 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Leaktightness in Htgrs: Experience at Fort St. Vrain.
A. J. Neylan, R. A. Barker, and A. F. Deardorff. 10 Jun 75, 9p CONF-750906-2
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Pressure vessels), Leak testing, Leaks.

For abstract, see NSA 32 08, number 21467.

GA-A-13423 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Review of the Literature Pertinent to Fission-Product Migration and Interaction in Fuel Rods.
B. D. Epstein. 6 Jun 75, 39p
Contract AT(04-3)-167

Descriptors: (*Gcfr type reactors, Fuel elements), (*Fuel elements, *Fission products), Data, Deposition, Diffusion.

For abstract, see NSA 32 08, number 21495.

GEAP-20615 PC$5.45/MF$2.25
General Electric Co., San Jose, Calif.
Estimating the Relative Probability of Piping Severance by Fault Cause.
S. A. Wilson. Sep 74, 66p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, Primary coolant circuits), (*Nuclear power plants, Primary coolant circuits), (*Primary coolant circuits, Pipes), (*Pipes, *Failures), Cracks, Stress analysis.

For abstract, see NSA 32 08, number 21439.

GERHTR-108 PC$6.25/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Chemische Technologie.
Determination of the Burnup, Neutron Fluence, Fission Product Concentration, and Heavy Metal Concentration in Individual Fuel Elements.
W. Litzow. Apr 74, 63p KFA-ICT-IB-3/74
In German. U.S. Sales Only.

Descriptors: (*Htgr type reactors, Fuel elements), (*Fuel elements, *Burnup), Fission products, Neutron fluence, Thorium, Uranium.

For abstract, see NSA 32 08, number 21468.

GERHTR-130 PC$4.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany).
Status and Purpose of Fuel Element Development for High Temperature Reactors.
E. Balthesen. 10 Jan 75, 20p
In German. U.S. Sales Only.

Descriptors: (*Htgr type reactors, *Fuel elements), Coated fuel particles, Dispersion nuclear fuels, Fuel spheres, Research programs, Reviews.

For abstract, see NSA 32 08, number 21469.

GKSS-74/E/43 PC$4.25/MF$2.25
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt m.b.H., Geesthacht-Tesperhude (F.R. Germany).
Requirements on a Low-Power Seawater Desalination Installation with Nuclear Energy Supply.
W. Bockhorn, H. Boie, S. Motzkau, and G. Petersen. 1974, 21p
In German. U.S. Sales Only.

Descriptors: (*Desalination reactors, *Economics), Cost, Evaporators, Pwr type reactors, Ship propulsion reactors.

For abstract, see NSA 32 08, number 21452.

HEDL-SA-680 PC$4.25/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Specifying and Manufacturing Piping for the Fast Flux Test Facility.
R. A. Moen, D. P. O'Keefe, J. E. Irvin, and J. C. Tobin. 19 Apr 74, 25p CONF-740606-21
Contract AT(45-1)2170

Descriptors: (*Fftf reactor, *Pipes), Design, Fabrication, Mechanical properties, Reactor materials, Reactor vessels, Specifications.

For abstract, see NSA 32 08, number 21530.

HEDL-SA-933 PC$4.75/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Fftf Fuel Pin Design Bases and Performance.
C. M. Cox, J. E. Hanson, W. E. Roake, R. J. Slember, and C. E. Weber. Apr 75, 35p CONF-750411-9
Contract AT(45-1)2170

Descriptors: (*Fftf reactor, *Fuel pins), Design, Performance, Specifications.

For abstract, see NSA 32 08, number 21531.

HEDL-TME-74-30 PC$5.45/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Some Aspects of Continuum Physics Used in Fuel Pin Modeling.
F. E. Bard. Jun 75, 154p
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, Fuel pins), (*Fuel pins, *Mathematical models), Fftf reactor, Fuel cans, Fuel pellets, Mathematics, Mechanical properties, Thermodynamic properties.

For abstract, see NSA 32 08, number 21502.

HEDL-TME-74-47(V.1) PC$13.60/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Melt-III: A Neutronics, Thermal-Hydraulics Computer Program for Fast Reactor Safety Analysis. Volume I.
A. E. Waltar, W. L. Partain, D. C. Kolesar, L. D. O'Dell, and A. Padilla, Jr.. Dec 74, 495p
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, *Reactor accidents), (*Computer codes, *M codes), Excursions, Heat transfer, Hydraulics, Mathematical models, Reactor kinetics, Reactor safety, Transients.

For abstract, see NSA 32 08, number 21503.

HEDL-TME-75-10 PC$4.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Heavy Section Steel Technology Program. Technical Report No. 36. The Irradiated Fracture Toughness of Astm A533, Grade B, Class 1 Steel Measured with a Four Inch Thick Compact Tension Specimen.
J. A. Williams. Jan 75, 30p
Contract AT(45-1)-2170

Descriptors: (*Pwr type reactors, Pressure vessels), (*Bwr type reactors, Pressure vessels), (*Pressure vessels, *Research programs), (*Steel-astm-a533, *Fracture properties), Physical radiation effects, Reactor materials, Tensile properties.

For abstract, see NSA 32 08, number 21440.

HEDL-TME-75-51 PC$4.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Exposure of Precracked and Preloaded Fracture Mechanics Specimens in Liquid Sodium, with an Intermediate Moist Nitrogen Cleaning.
L. A. James, and R. R. Borisch. May 75, 21p
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, Reactor components), (*Reactor components, *Cracks), Chemical reactions, Cleaning, Mechanical tests, Nitrogen, Sodium, Stainless steel-304, Stresses.

For abstract, see NSA 32 08, number 21505.

LA-tr-75-14 PC$7.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Layout, Irradiation, and Post-Irradiation-Examination of the Short-Time, Mixed-Carbide-Irradiation-Experiment Loop-4A.
F. Weimar, and H. Fiedler. 1975, 95p

Descriptors: (*Fbr type reactors, Fuel pellets), (*Fuel rods, *Performance testing), (*Fuel pellets, Performance testing), (*Plutonium carbides, *Physical radiation effects), Specifications, Uranium carbides.

For abstract, see NSA 32 08, number 21506.

NP-20430 PC$4.00/MF$2.25
Bundesministerium des Innern, Bonn (F.R. Germany).
Guidelines for the Professional Evaluation of the Personnel of Nuclear Power Plants.
8 Oct 74, 13p
In German. U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Personnel), Management, Reactor operation, Recommendations.

For abstract, see NSA 32 08, number 21782.

ORNL-TM-4938 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Oak Ridge Research Reactor Quarterly Report October, November, and December of 1974.
S. S. I Hurt, II, and E. D. Lance. Jul 75, 29p
Contract W-7405-eng-26

Descriptors: (*Orr reactor, *Reactor operation), Reactor fueling, Reactor maintenance, Research programs.

For abstract, see NSA 3208

ORNL-TM-4963 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Bearings for the Hfir Control Plates.
A. A. Abbatiello. Aug 75, 30p
Contract W-7405-eng-26

Descriptors: (*Hfir reactor, *Control rod drives), Bearings, Wear.

For abstract, see NSA 32 08, number 21537.

PB-245 119/3GA PC$8.75/MF$2.25
Applied Nucleonics Co., Inc., Santa Monica, Calif.
Seismic Design of Nuclear Power Plants. An Assessment.
Final rept.,
George E. Howard, Paul Ibanez, and Craig B. Smith. Jun 75, 280p EPRI-273-FR

Descriptors: *Nuclear power plants, *Seismic surveys, *Site surveys, Design criteria, Structural design, Standards.

This report contains a review and evaluation of the analytical methods, design methods, and design standards used in the seismic design of nuclear power plants. Three major areas were investigated: (a) soils, siting, and seismic ground motion specification; (b) soil-structure interaction; (c) the response of major nuclear power plant structures and components. The purpose of this review and evaluation program was to prepare an independent assessment of the state-of-the-art of the seismic design of nuclear power plants and to identify seismic analysis and design research areas meriting support by the various organizations comprising the 'nuclear power industry'. Criteria used for evaluating the relative importance of alternative research areas included the potential research impact on nuclear power plant siting, design, construction, cost, safety, licensing, and regulation. Within the time limitation imposed on this study, the authors recognize that the effort cannot be complete. This report can serve as a basis for a continuing dialogue to exchange ideas and issues.

PB-245 616/8GA PC$7.00/MF$2.25
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Construction of Koshkonong Nuclear Plant, Units 1 and 2. Wisconsin Electric Power Company, Wisconsin Power and Light Company, Wisconsin Public Service Corporation, Madison Gas and Electric Company. Docket Nos. STN-50-502, STN-50-503.
Oct 75, 194p NUREG-75/092

Descriptors: *Nuclear power plants, *Nuclear reactor safety, Nuclear electric power generation, Nuclear reactor sites, Design criteria, Seismic surveys, Nuclear reactor engineering, Radioactive waste processing, Wisconsin.
Identifiers: *Koshkonong nuclear power plant, Jefferson County(Wisconsin).

A safety evaluation of Wisconsin Electric Power Company's application for a license to construct and operate the nuclear plant located in Jefferson County, Wisconsin, has been prepared. The evaluation consists of a technical review and staff evaluation of applicant information on: (1) population density, land use, and physical characteristics of the site area; (2) design, fabrication, testing criteria, quality assurance program, and performance characteristics of plant structures, systems, and components important to safety; (3) expected response of the facility to anticipated operating transients, and to postulated design basis accidents; (4) applicant engineering and construction organization, and plans for the conduct of plant operations; and (5) design criteria for a system to control the plant's radiological effluents. The staff has concluded that the plant can be designed and constructed and can be operated at the proposed location without endangering the health and safety of the public provided the outstanding matters discussed in the report are favorably resolved.

RD/B/N-3195 PC$4.25/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Effect of Liquid Sodium on the Tensile and Creep-Rupture Properties of Incoloy-800: A Preliminary Study.
J. E. Cordwell, and R. D. Nicholson. Feb 75, 22p
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Steam generators), (*Steam generators, Tubes), (*Tubes, *Performance testing), (*Incoloy 800, *Tensile properties), Argon, Carbon, Carburization, Cracks, Creep, Diffusion, Embrittlement, Liquid metals, Mechanical tests, Sodium.

For abstract, see NSA 32 08, number 21509.

RT/FI-(75)2 PC$6.75/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Buckling Measurements for Thorium Lattices in the Eco Reactor.
F. Amoroso, U. Broccoli, A. Colombino, V. Tosi, and A. Vigo. Jan 75, 74p
In Italian. U.S. Sales Only.

Descriptors: (*Reactor lattices, *Buckling), Comparative evaluations, Configuration, Eco reactor, Thorium oxides, Uranium dioxide.

For abstract, see NSA 32 08, number 21538.

WANL-TME-1159 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Quadrant C Hot Cave Handling Equipment for NASA Experiment 62-06. Summary Report.
Jun 65, 39p
Contract NAS3-5209

Descriptors: (*Pbr reactor, *Hot cells), Remote handling equipment, Specifications.

For abstract, see NSA 32 08, number 21539.

WAPD-TM-1172 PC$9.00/MF$2.25
Bettis Atomic Power Lab., West Mifflin, Pa.
Chemical and Spectrochemical Production Analysis of Tho sub 2 and exp 233 Uo sub 2 - Tho sub 2 Pellets for the Light Water Breeder Reactor Core for Shippingport (Lwbr Development Program).
J. F. Bukowski, and E. D. Hollis. Jun 75, 119p
Contract AT(36-1)-GEN-14

Descriptors: (*Shippingport reactor, *Fuel pellets), (*Lwbr type reactors, Fuel pellets), (*Thorium oxides, *Quantitative chemical analysis), (*Uranium dioxide, Quantitative chemical analysis), Emission spectroscopy, Impurities, Mass spectroscopy.

For abstract, see NSA 32 08, number 21510.

18F. Radiation Shielding and Protection

DP-MS-74-58 PC$5.50/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Dynamics of Impact in Drop Tests of Packaging.
J. W. Langhaar. 1975, 48p CONF-750411-7

Descriptors: (*Fissile materials, *Transport), (*Radioactive materials, Transport), (*Casks, *Impact tests), Iaea, Impact shock, Impact strength, Regulations, Safety.

For abstract, see NSA 32 08, number 20440.

KFK-2155 PC$11.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Strahlenschutz und Sicherheit.
Annual Report of the Radiation Protection and Safety Department, 1974.
H. Kiefer, and W. Koelzer. May 75, 157p
In German. U.S. Sales Only.

Descriptors: (*German federal republic, Nuclear facilities), (*Nuclear facilities, *Personnel dosimetry), Personnel, Radiation protection, Safety.

For abstract, see NSA 3208

SAND-75-0248 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.

Transportation Environment Data Bank Index.
C. A. Davidson, and J. T. Foley. Jun 75, 37p
Contract AT(29-1)-789

Descriptors: (*Radioactive materials, *Transport), (*Casks, *Environments), Accidents, Explosions, Fires, Hazards, Heat, Humidity, Impact shock, Indexes, Radiation hazards, Safety, Testing, Wind.

For abstract, see NSA 32 08, number 20441.

18G. Radioactive Wastes and Fission Products

ARH-2656B PC$6.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Atlantic Richfield Hanford Company Semiannual Report, 02 Process Development, November 1, 1972--April 30, 1973.
H. H. Hopkins, Jr.. Jun 73, 60p
Contract AT(45-1)-2130

Descriptors: (*Plutonium, *Solvent extraction), (*Thorium, Solvent extraction), (*Radioactive waste processing, *Solidification), (*Radioactive waste management, Solidification), Dissolution, Leaching, Plutonium dioxide, Research programs, Soils.

For abstract, see NSA 32 08, number 19396.

BNL-20032 PC$4.25/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Savannah River Laboratory Long-Term Waste Storage Program. Progress Report No. 9, January--March 1975.
Apr 75, 21p

Descriptors: (*Radioactive waste storage, *Research programs), Cements, Concretes, Leaching, Solidification, Stability, Zeolites.

For abstract, see NSA 3208

BNWL-1885 PC$7.60/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Avifauna of Waste Ponds Erda Hanford Reservation, Benton County, Washington.
R. E. Fitzner, and W. H. Rickard. Jun 75, 96p
Contract AT(45-1)-1830

Descriptors: (*Hapo, *Radioactive waste storage), (*Birds, *Radionuclide kinetics), (*Ponds, *Radionuclide migration), Aquatic ecosystems, Food chains, Terrestrial ecosystems.

For abstract, see NSA 32 08, number 19769.

LA-5993-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Characterization of Transuranic Solid Wastes from a Plutonium Processing Facility.
R. Mulkin. Jun 75, 24p

Descriptors: (*Radioactive waste storage, *Solid wastes), Nondestructive analysis, Plutonium, Radioactive waste processing, Transuranium elements.

For abstract, see NSA 32 08, number 19398.

18H. Radioactivity

DUN-3062 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
Radiological Status Report Deactivation Status: D Plant.
W. J. Tatum. 6 Oct 67, 10p
Contract AT(45-1)-1857

Descriptors: (*Hanford production reactors, *Decontamination), Radiation monitoring, Reactor shutdown.

For abstract, see NSA 32 08, number 21546.

DUN-6664 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
K Through Reactor Decontamination Engineering Report.
L. B. Brinkman. 21 Jan 70, 7p
Contract AT(45-1)-1857

Descriptors: (*Hanford production reactors, *Decontamination), Planning, Reactor cooling systems.

For abstract, see NSA 32 08, number 21547.

DUN-7593 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
Radiological Status Report Deactivation of the 105-B Reactor Plant.
W. G. Westover. 12 Apr 71, 15p

Descriptors: (*Hanford production reactors, *Radiation monitoring), Buildings, Decontamination.

For abstract, see NSA 32 08, number 21548.

DUN-7630 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
Radiological Status Report Deactivation of the 105-kw Reactor Plant.
26 Apr 71, 14p

Descriptors: (*Hanford production reactors, *Decontamination), Buildings, Radiation hazards.

For abstract, see NSA 32 08, number 21549.

DUN-7636 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
Radiological Status Report. Deactivation of the 105-Ke Reactor Plant.
W. G. Westover. 30 Apr 71, 18p

Descriptors: (*Hanford production reactors, *Decontamination), Buildings, Radiation hazards, Radiation monitoring.

For abstract, see NSA 32 08. number 21550.

NVO-269-23 PC$4.00/MF$2.25
Washington Univ., Seattle Coll. of Fisheries.
Amchitka Radiobiological Program Progress Report, January 1974--December 1974.
V. A. Nelson, and A. H. Seymour. May 75, 52p
Contract AT(26-1)-269

Descriptors: (*Amchitka island area, *Natural radioactivity), (*Gamma sources, *Radiation monitoring), (*Strontium 90, Radiation monitoring), (*Tritium, Radiation monitoring), Algae, Birds, Fishes, Invertebrates, Lichens, Mosses, Plants, Rats, Sampling, Seawater, Surface air, Surface waters.

For abstract, see NSA 32 08, number 19770.

18I. Reactor Engineering and Operation

AECL-5045 PC$5.00/MF$2.25
Atomic Energy of Canada Ltd., Sheridan Park, Ontario. Power Projects.
On-Line Control of the Candu-Phw Power Distribution.
E. Hinchley, and G. Kugler. Mar 75, 39p CONF-7410124-2
U.S. Sales Only.

Descriptors: (*Phwr type reactors, *On-line control systems), Feedback, Power distribution, Reactor kinetics, Xenon oscillations.

For abstract, see NSA 32 08, number 21732.

AECL-5060 PC$4.00/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
Rewetting of a Hot Surface.
T. S. Thompson. Apr 75, 8p CONF-740925-9
U.S. Sales Only.

Descriptors: (*Fuel cans, *Heat transfer), Coolants, Film boiling, Flow rate, Surfaces, Temperature dependence, Thermal conduction, Wettability.

For abstract, see NSA 32 08, number 21625.

ANCR-1219 PC$7.60/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
Contempt-Lt: A Computer Program for Predicting Containment Pressure-Temperature Response to a Loss-of-Coolant Accident.
L. L. Wheat, R. J. Wagner, G. F. Niederauer, and C. F. Obenchain. Jun 75, 231p

Descriptors: (*Bwr type reactors, Loss of coolant), (*Pwr type reactors, Loss of coolant), (*Loss of coolant, *Mathematical models), (*Computer codes, *C codes), Containment buildings, Pressure gradients, Temperature distribution.

For abstract, see NSA 32 08, number 21627.

ANL-75-31 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Physics of Reactor Safety. Quarterly Report, January--March 1975.
1975, 33p
Contract W-31-109-Eng-38

Descriptors: (*Reactor safety, *Research programs), (*Lmfbr type reactors, *Loss of flow), (*Clinch river breeder reactor, Loss of flow), (*Zpr-3 reactor, *Reactor kinetics), Computer codes, Meltdown, Reactor accidents, Reactor core disruption, Simulation.

For abstract, see NSA 32 08, number 21628.

BNWL-B-417 PC$5.45/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Models for Predicting the Removal of Airborne Contaminants by Reactor Containment Sprays.
A. K. Postma, R. L. Ritzman, J. A. Gieseke, and E. W. Schmidt. 27 Jun 75, 122p
Contract AT(45-1)-1830

Descriptors: (*Pwr type reactors, Containment spray systems), (*Containment spray systems, *Performance), Iodine, Mathematical models, Removal.

For abstract, see NSA 32 08, number 21629.

CONF-740301-5 PC$4.50/MF$2.25
Liquid Metal Engineering Center, Canoga Park, Calif.
Friction and Wear in Sodium.
N. J. Hoffman, and J. J. Droher. 1973, 29p
Contract AT(04-3)700

Descriptors: (*Sodium cooled reactors, Reactor components), (*Reactor components, *Wear), Friction, Sliding friction, Sodium.

For abstract, see NSA 32 08, number 21716.

CONF-750418-3 PC$4.50/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
Reliability Modeling of Clinch River Breeder Reactor Electrical Shutdown Systems.
R. A. Schatz, and K. L. Duetsch. 1974, 28p

Descriptors: (*Clinch river breeder reactor, *Reactor protection systems), Mathematical models, Reactor instrumentation, Reactor safety, Reactor shutdown, Reliability, Statistics.

For abstract, see NSA 32 08, number 21631.

CONF-750468-1 PC$6.25/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
Decay Heat Removal for the Liquid Metal Fast Breeder Reactor.
P. P. Zemanick, and N. W. Brown. 1975, 62p

Descriptors: (*Clinch river breeder reactor, Rhr systems), (*Rhr systems, *Reliability), After-heat removal, Performance, Reactor safety.

For abstract, see NSA 32 08, number 21632.

CONF-750804-3 PC$8.50/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
Heat Transfer and Friction Correlations Required to Describe Steam--Water Behavior in Nuclear Safety Studies.
C. W. Solbrig, J. H. McFadden, R. W. Lyczkowski, and E. D. Hughes. 1975, 107p

Descriptors: (*Pwr type reactors, Loss of coolant), (*Loss of coolant, *Heat transfer), (*Bwr type reactors, Loss of coolant), Critical heat flux, Friction, Hydrodynamics, Mathematical models, Reactor safety, Two-phase flow.

For abstract, see NSA 32 08, number 21633.

CONF-750804-4 PC$5.50/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
Pipe Blowdown Analysis Using Explicit Numerical Schemes.
R. W. Lyczkowski, R. A. Grimesey, and C. W. Solbrig. 1974, 46p

Descriptors: (*Pwr type reactors, Blowdown), (*Bwr type reactors, Blowdown), (*Blowdown, *Fluid flow), Differential equations, Heat transfer, Loss of coolant, Numerical solution, Pipes, Reactor safety, Ruptures.

For abstract, see NSA 32 08, number 21634.

CONF-750804-5 PC$5.00/MF$2.25
Pittsburgh Univ., Pa. Dept. of Chemical Engineering.
Partial Flow Blockage Effects within a (Liquid Metal Cooled Fast Reactor) Lmfbr Fuel Assembly.
A. A. Bishop, F. C. Engel, and R. A. Markley. 1975, 38p
Contract AT(11-1)-2395

Descriptors: (*Lmfbr type reactors, Flow blockage), (*Flow blockage, *Heat transfer), Boiling, Liquid flow, Sodium, Temperature distribution, Turbulent flow.

For abstract, see NSA 32 08, number 21635.

CONF-750804-9 PC$5.00/MF$2.25
Westinghouse Research Labs., Pittsburgh, Pa.
Measurements of Velocities Downstream of Blocked Subchannels in a Model Reactor Rod Bundle.
B. J. Vegter, R. M. Roidt, M. J. Pechersky, and R. A. Markley. 30 Dec 74, 37p

Descriptors: (*Lmfbr type reactors, Fuel assemblies), (*Fuel assemblies, *Flow blockage), Liquid flow, Mockup, Reactor cores, Reactor safety, Simulation, Velocity.

For abstract, see NSA 32 08, number 21636.

COO-2571-1 PC$4.00/MF$2.25
Brigham Young Univ., Provo, Utah Dept. of Chemical Engineering.
Improvement and Verification of Fast Reactor Safety Analysis Techniques. Progress Report, March 1, 1975--May 31, 1975.
J. F. Jackson. 1975, 7p
Contract AT(11-1)-2571

Descriptors: (*Lmfbr type reactors, Reactor safety), (*Reactor safety, *Research programs), Computer calculations, Excursions, Mathematical models, Reactor core disruption.

For abstract, see NSA 3208

DUN-3898 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
B Reactor Deactivation Engineering Report.
L. B Brinkman. 29 Feb 68, 9p
Contract AT(45-1)-1857

Descriptors: (*Hanford production reactors, *Decontamination), Planning, Reactor shutdown, Recommendations.

For abstract, see NSA 32 08, number 21638.

ERDA-tr-47 PC$6.25/MF$2.25
Application of Weld Forming Technique to Manufacturing of Austenitic Stainless Steel Elbow for Nuclear Power Plant Service.
A. Ujiie, S. Sato, T. Sunamoto, M. Yamamoto, and K. Uragami. 1974, 61p
Translation of Mitsubishi technical bulletin No. 96.

Descriptors: (*Pwr type reactors, Pipes), (*Bwr type reactors, Pipes), (*Pipes, *Fabrication), Pipe joints, Primary coolant circuits, Specifications, Welded joints.

For abstract, see NSA 32 08, number 21717.

GA-A-13280 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Gcr Safety Program. Quarterly Progress Report for the Period October 1, 1974--December 31, 1974.
14 Feb 75, 43p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, *Containment systems), (*Gcfr type reactors, Reactor safety), (*Reactor safety, *Research programs), (*Control elements, *Seismic effects), Atmospheres, Combustion, Reactor accidents, Reactor components, Reliability, Scram.

For abstract, see NSA 3208

GA-A-13300 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Evaluation of Alternative Shutdown-Systems Concepts for the Gas-Cooled Fast Breeder Reactor.
K. Antonsen, and G. L. Cauble. 7 May 75, 33p
Contract AT(04-3)-167

Descriptors: (*Gcfr type reactors, *Reactor protection systems), Comparative evaluations, Control rod drives, Reactor safety, Reactor shutdown.

For abstract, see NSA 32 08, number 21642.

HEDL-TME-74-47(V.2) PC$13.60/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Melt-III: A Neutronics, Thermal-Hydraulics Computer Program for Fast Reactor Safety Analysis. Volume II.
A. E. Waltar, W. L. Partain, D. C. Kolesar, L. D. O'Dell, and A. Padilla, Jr.. Dec 74, 265p
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, *Reactor safety), (*Computer codes, *M codes), Hydraulics, Reactor accidents, Reactor kinetics.

For abstract, see NSA 32 08, number 21645.

MRR-143 PC$5.00/MF$2.25
Technische Univ. Muenchen, Garching (F.R. Germany). Lab. fuer Reaktorregelung und Anlagensicherung.
Failure Behavior of a Dynamic Trip Unit.
S. Gossner. Feb 75, 38p
In German. U.S. Sales Only.

Descriptors: (*Nuclear power plants, Reactor protection systems), (*Reactor protection systems, Electronic equipment), (*Electronic equipment, *Failures), Performance, Reliability.

For abstract, see NSA 32 08, number 21718.

MRR-146 PC$6.25/MF$2.25
Technische Univ. Muenchen, Garching (F.R. Germany). Lab. fuer Reaktorregelung und Anlagensicherung.
Analytical One-Dimensional Frequency Model for U-Tube Heat Exchangers with Respect to the Input and Output Mass Flow Temperatures on the Primary and Secondary Sides.
R. Kosowski, and A. Hoeld. Apr 75, 61p
In German. U.S. Sales Only.

Descriptors: (*Power reactors, Heat exchangers), (*Heat exchangers, *Mathematical models), Disturbances, Flow rate, Fluid flow, One-dimensional calculations, Temperature distribution.

For abstract, see NSA 32 08, number 21719.

NP-20387 PC$12.00/MF$2.25
Department of Atomic Energy, Bombay (India).
Annual Report of the Department of Atomic Energy, 1974--1975.
1975, 176p
U.S. Sales Only.

Descriptors: (*India, *Research programs), (*Nuclear power, Research programs), (*Reactors, Research programs), (*Nuclear physics, Research programs), Indian organizations.

For abstract, see NSA 3208

NP-20452 PC$17.75/MF$2.25
Norges Teknisk-Naturvitenskapelige Forskningsraad, Oslo.
Annual Report, 1974.
1975, 277p
In Norwegian. U.S. Sales Only.

Descriptors: (*Norwegian organizations, *Research programs), (*Nuclear energy, Research programs), Activated carbon, Activation analysis, Crystallography, Deformation, Education, Filters, Fuel elements, Fuel management, Fuel-cladding interactions, Hbwr reactor, Heat treatments, In core instruments, Irradiation plants, Irradiation procedures, Isotope applications, Isotope production, Jeep-2 reactor, National organizations, Neutron diffraction, Norway, On-line control systems, Pressure vessels, Prestressed concrete, Rare earths, Reactor control systems, Reactor operation, Reactor safety, Reliability, Underground nuclear stations.

For abstract, see NSA 3208

NP-20486 PC$5.25/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
Japan Atomic Energy Research Institute Annual Report and Accounts, 1973/1974.
1974, 42p
U.S. Sales Only.

Descriptors: (*Japan, *Research programs), (*Nuclear energy, Research programs), Environment, Food, Information, International cooperation, Nuclear power plants, Radiation protection, Radioactive waste management, Radiopreservation, Safety, Security, Thermonuclear reactors.

For abstract, see NSA 3208

NP-20505 PC$8.50/MF$2.25
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine e.V., Koeln (F.R. Germany).
Annual Report, 1974.
1975, 110p
In German. U.S. Sales Only.

Descriptors: (*Reactor safety, *Research programs), German fr organizations, Reactor licensing.

For abstract, see NSA 3208

NP-20516 PC$7.50/MF$2.25
Kraftwerk Union A.G., Erlangen (F.R. Germany). Reaktortechnik.
Safety-Technical Research Program: Condensation and Free-Blowing Research. Final Report.
H. Sobottka. Jun 75, 90p
In German. U.S. Sales Only.

Descriptors: (*Water cooled reactors, *Pressure suppression), (*Bwr type reactors, Pressure suppression), Blowdown, Nozzles, Reactor safety, Steam, Vapor condensation, Water.

For abstract, see NSA 32 08, number 21660.

ORNL-NSIC-122 PC$15.00/MF$2.25
Oak Ridge National Lab., Tenn.
Annotated Bibliography of Safety-Related Occurrences in Nuclear Power Plans as Reported in 1974.
R. L. Scott, and R. B. Gallaher. May 75, 6p
Contract W-7405-eng-26

Descriptors: (*Nuclear power plants, Reactor accidents), (*Reactor accidents, *Bibliographies), Reactor safety.

For abstract, see NSA 32 08, number 21661.

ORNL-TM-4914(V.3) PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.
Quarterly Progress Report on Reactor Safety Programs Sponsored by the Nrc Division of Reactor Safety Research for January--March 1975. Vol. Iii: Liquid-Metal-Cooled Fast Breeder Reactor Safety.
M. H. Fontana, and T. S. Kress. Jul 75, 56p
Contract W-7405-eng-26

Descriptors: (*Lmfbr type reactors, Reactor core disruption), (*Reactor core disruption, *Fission product release), (*Reactor safety, *Research programs), Aerosols, Evaporation, Fuel elements, Gases, Mockup, Reactor vessels, Simulation, Transuranium elements, Uranium dioxide.

For abstract, see NSA 32 08, number 21662.

ORNL-TM-4950 PC$5.25/MF$2.25
Oak Ridge National Lab., Tenn.
Monthly Highlights for Office of Nuclear Regulatory Research Programs at Oak Ridge National Laboratory.
G. G. Fee. Apr 75, 42p
Contract W-7405-eng-26

Descriptors: (*Reactor safety, *Research programs), Blowdown, Fission product release, Fuel cans, Heat transfer, Htgr type reactors, Information systems, Lmfbr type reactors, Loss of coolant, Oxidation, Pwr type reactors, Us nrc, Water, Water cooled reactors, Zircaloy, Zirconium.

For abstract, see NSA 32 08, number 21663.

RD/B/N-3262 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Study of the Condensation of Vapour Jet Injected Into Subcooled Liquid Pools.
C. P. Greef. Mar 75, 16p
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Reactor accidents), (*Reactor accidents, *Subcooled boiling), Bubbles, Freons, Heat transfer, Jets, Pool boiling, Reactor safety, Sodium, Sound waves, Vapor condensation, Vapors, Water.

For abstract, see NSA 32 08, number 21665.

RT/ING-(74)35 PC$10.75/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Rebo: Computer Code for the Generation of a Three-Dimensional Finite-Element Grid of the Nozzle-Cylindrical Vessel Junction Zone.
G. Massini, and E. Zolti. Dec 74, 154p
In Italian. U.S. Sales Only.

Descriptors: (*Computer codes, *R codes), (*Pressure vessels, *Nozzles), Configuration, Coordinates, Cylinders, Fortran, Ibm computers, Interfaces, Three-dimensional calculations.

For abstract, see NSA 3208

TID-26793 PC$7.60/MF$2.25
USAEC, Washington, D.C.
1974 Annual Report to Congress. Part One: Operating and Developmental Functions. Part Two: Regulatory Functions.
1974, 253p

Descriptors: (*Us aec, *Regulations), Reactor licensing, Research programs.

For abstract, see NSA 32 08, number 21784.

TID-26826 PC$5.45/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Experimental Investigation of the Fragmentation of Molten Metals in Water.
G. M. Bjorkquist. Jun 75, 81p

Descriptors: Bismuth, Fragmentation, Fuel-coolant interactions, Heat transfer, High temperature, Reactor safety, Temperature dependence, Tin, Very high temperature, Water.

For abstract, see NSA 32 08, number 21666.

TID-26827 PC$7.60/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Nuclear Engineering.
Thermal Stress Initiated Fracture as a Fragmentation Mechanism in the Uo sub 2 --Sodium Fuel-Coolant Interaction.
R. B. Knapp. May 75, 201p

Descriptors: (*Lmfbr type reactors, Fuel-coolant interactions), (*Fuel-coolant interactions, *Fragmentation), Fracture properties, Sodium, Thermal stresses, Uranium dioxide.

For abstract, see NSA 32 08, number 21667.

TUBIK-40 PC$7.25/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
Wotan: A Digital Program for the Simulation of a Once-Through Steam Generator.
D. Luebbesmeyer. Dec 74, 84p
In German. U.S. Sales Only.

Descriptors: (*Water cooled reactors, Steam generators), (*Steam generators, *Fluid flow), (*Computer codes, *W codes), Heat transfer, Simulation.

For abstract, see NSA 32 08, number 21723.

UCLA-34P203-2 PC$6.00/MF$2.25
California Univ., Los Angeles Dept. of Energy and Kinetics.
Dry out of a Fluidized Particle Bed with Internal Heat Generation.
R. S. Keowen, and I. Catton. Mar 75, 59p UCLA-24P223-2, UCLA-ENG-7519
Contract AT(04-3)PA203

Descriptors: (*Lmfbr type reactors, Reactor core disruption), (*Fluidized bed, *Dryout), (*Reactor core disruption, *After-heat removal), Heat transfer, Lead, Meltdown, Porosity, Simulation, Steels, Water.

For abstract, see NSA 32 08, number 21668.

UCLA-34P223X1 PC$4.00/MF$2.25
California Univ., Los Angeles.
Safety Considerations of Commercial Liquid Metal Fast Breeder Reactors. Progress Report, 15 June 1974--1 December 1974.
W. E. Kastenberg, and I. Catton. 1974, 15p
Contract AT(04-3)-34

Descriptors: (*Lmfbr type reactors, Reactor safety), (*Reactor safety, *Research programs), After-heat removal, Computer codes, Fuel elements, Fuel-coolant interactions, Heat transfer, Mathematical models, Reactor accidents, Reactor core disruption, Thermodynamics, Transients.

For abstract, see NSA 3208

UCLA-34P223X2 PC$4.00/MF$2.25
California Univ., Los Angeles.
Safety Considerations of Commercial Liquid Metal Fast Breeder Reactors. Progress Report for the Period January 1, 1975--March 31, 1975.
W. E. Kastenberg, and I. Catton. 1975, 16p
Contract AT(04-3)-34

Descriptors: (*Reactor safety, *Research programs), (*Lmfbr type reactors, Reactor safety), After-heat removal, Computer codes, Fuel elements, Fuel-coolant interactions, Heat transfer, Mathematical models, Reactor accidents, Reactor core disruption, Thermodynamics, Transients.

For abstract, see NSA 32 08, number 21670.

WANL-TME-1126(Sup.2)(Rev.I) PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx/Est Safety Evaluation Report.
20 Nov 65, 25p

Descriptors: (*Nrx-a4-est reactor, *Reactor safety).

For abstract, see NSA 32 08, number 21671.

WANL-TME-1126(Sup.3) PC$4.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx/Est Safety Evaluation Report .
27 Dec 65, 29p

Descriptors: (*Nrx-a4-est reactor, *Reactor safety), Reactor start-up.

For abstract, see NSA 32 08, number 21672.

WANL-TME-258 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Development Plan for Nuclear Instrumentation System (For Inclusion in Instrumentation Data Book) (Preliminary).
4p

Descriptors: (*Nerva reactor, Reactor control systems), (*Reactor control systems, *Research programs), Data, Neutron detectors.

For abstract, see NSA 32 08, number 21737.

18J. Reactor Materials

AAEC/E-331 PC$5.00/MF$2.25
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
Measurement of Swirling Flow in Hifar Fuel Elements and the Effects of Fitting Flowsplitters.
J. Marshall. Jan 75, 37p
U.S. Sales Only.

Descriptors: (*Hifar reactor, *Flow regulators), Coolants, Fuel elements, Liquid flow, Nozzles, Turbulent flow, Velocity, Vortex flow, Vortices.

For abstract, see NSA 32 08, number 21544.

AD-A015 619/0GA PC$4.25/MF$2.25
Naval Research Lab Washington D C
Irradiation Effects on Reactor Structural Materials.
Semi-annual progress rept. 1 Feb-31 Jul 75,
Lendell E. Steele. Aug 75, 60p Rept no. NRL-MR-3110
See also report dated Feb 75, AD-A010 510.

Descriptors: *Reactor materials, *Radiation effects, Stainless steel, Nickel, Nickel alloys, Welds, Impurities, Creep, Fatigue(Mechanics), Crack propagation, Neutron irradiation, Elastic properties, Toughness, Notch toughness, Forging, Test methods.
Identifiers: Steel 316, Swelling, Ferrite.

This report, covering research for the period, 1 February to 31 July 1975, includes: (1) the effect of hold time on fatigue crack propagation in neutron irradiated Type 316 stainless steel; (2) the simulation of irradiation-induced creep in nickel; (3) the elastic plastic toughness of Type 316 stainless steel forging; (4) swelling in dilute binary alloys; and (5) the influence of delta ferrite content on notch toughness of austenitic stainless steel weldments.

AD-A016 185/1GA PC$7.50/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Nuclear Fuel Reprocessing Expansion Strategies.
Technical rept.,
James M. Gallagher. May 75, 237p Rept no. SOL-75-11
Contract N00014-75-C-0865

Descriptors: *Reactor fuel processing, *Economic models, Cost effectiveness, Cost analysis, Linear programming, Forecasting, Investments, Radioactive wastes, Waste disposal, Waste management, Energy management, Fuel consumption.
Identifiers: *Nuclear fuel reprocessing, Mixed integer programming, Fuel reprocessing plants, *Energy forecasts, *Economic forecasting, Nuclear electric power generation, Economies of scale.

This report describes an interdisciplinary effort to apply the techniques of operations research and energy system modeling to a problem of concern to the nuclear-electric power system, namely, determination of cost-effective strategies for capacity expansion of the domestic nuclear fuel reprocessing industry for the 1975-2000 time period. The research also determines cost disadvantages associated with alternative strategies which may be attractive for political, social, or ecological reasons. The sensitivity of results to changes in cost assumptions is investigated at some length.

BNWL-1907 PC$7.60/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Technical and Economic Feasibility of Partitioning Hanford Purex Process Acid Waste.
R. E. Burns, J. N. Hartley, D. H. Lester, F. P. Roberts, and J. L. Swanson. May 75, 57p
Contract AT(45-1)-1830

Descriptors: (*Hapo, Radioactive waste processing), (*Radioactive waste processing, *Solvent extraction), Actinides, Flowsheets, Liquid wastes, Purex process, Solid wastes.

For abstract, see NSA 32 08, number 19409.

DP-MS-75-34 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Californium-252: Status and Prospects.
P. H. Permar, and D. G. Karraker. Sep 75, 12p
CONF-750913-2
Contract AT(07-2)-1

Descriptors: (*Californium 252, *Uses), (*Neutron sources, Californium 252), Activation analysis, Economics, Exploration, Forecasting, Minerals, Neutron radiography, Subcritical assemblies.

For abstract, see NSA 32 08, number 19860.

ERDA-7 PC$5.45/MF$2.25
Battelle Human Affairs Research Center, Seattle, Wash.
Societal Risk Approach to Safeguards Design and Evaluation.
C. A. Bennett, W. M. Murphey, and T. S. Sherr. Jun 75, 63p

Descriptors: (*Fissile materials, *Safeguards), Hazards, Sabotage, Sociology.

For abstract, see NSA 32 08, number 20428.

GA-A-13366 PC$7.60/MF$2.25
General Atomic Co., San Diego, Calif.
Thorium Utilization Program. Quarterly Progress Report for the Period Ending 28 February, 1975.
30 May 75, 208p

Descriptors: (*Fuel reprocessing plants, *Design), (*Spent fuels, *Reprocessing), Coated fuel particles, Crushing, Flowsheets, Fluidized-bed combustion, Fuel cycle, Fuel elements, Htgr type reactors, Leaching, Materials handling, Measuring instruments, Nuclear fuel conversion, Physical properties, Research programs, Solvent extraction, Thorium.

For abstract, see NSA 3208

HEDL-TME-75-31 PC$5.45/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Plutonium Partitioning in the Purex Process with Hydrazine-Stabilized Hydroxylamine Nitrate.
G. L. Richardson, and J. L. Swanson. Jun 75, 92p
Contract AT(45-1)-2170

Descriptors: (*Plutonium, *Partition), (*Computer codes, *S codes), Amines, Computer calculations, Flowsheets, Hydrazine, Nitrates, Purex process, Solvent extraction, Solvent properties, Uranium.

For abstract, see NSA 32 08, number 19412.

KFK-2169 PC$6.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Datenverarbeitung und Instrumentierung.
Api Used for Control of a Reprocessing Plant.
B. Petruschka. May 75, 72p
In German. U.S. Sales Only.

Descriptors: (*Wak, *On-line control systems), (*Computer codes, *A codes), Data processing.

For abstract, see NSA 32 08, number 19414.

LA-2429 PC$12.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Processing and Testing of Mo--Uo sub 2 Fuel Elements.
W. H. Lenz, C. E. Peterson, and J. M. Taub. 5 Dec 60, 178p
Contract W-7405-ENG-36

Descriptors: (*Molybdenum alloys, *Fabrication), (*Uranium dioxide, Fabrication), Foils, Fuel elements, Hot working, Losses, Pressing, Rolling, Sheets, Sintering, Very high temperature.

For abstract, see NSA 32 08, number 20210.

ORNL-2788 PC$10.50/MF$2.25
Oak Ridge National Lab., Tenn.
Chemical Technology Division Annual Progress Report for Period Ending August 31, 1959.
22 Sep 59, 147p
Contract W-7405-eng-26

Descriptors: (*Spent fuels, *Reprocessing), Amex process, Dapex process, Darex process, Fluoride volatility process, Fluorox process, Head end processes, Neptunium, Pilot plants, Radioactive waste disposal, Radioactive waste processing, Research programs, Solvent extraction, Uranium, Uranium hexafluoride.

For abstract, see NSA 32 08, number 19415.

ORO-4212-16 PC$15.75/MF$2.25
Florida Univ., Gainesville Engineering and Industrial Experiment Station.
Quantitative Determination of the Structure-Property Relationships in Nuclear Fuel Element Materials. Final Report, June 1969--July 1973.
F. N. Rhines, R. T. DeHoff, and E. D. Whitney. May 75, 255p
Contract AT(40-1)-4212

Descriptors: (*Solid fuels, *Mechanical properties), (*Nickel, Mechanical properties), (*Uranium dioxide, Mechanical properties), Microscopy, Microstructure, Physical properties, Powders, Research programs.

For abstract, see NSA 32 08, number 21730.

SAND-75-0391 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.

Physical Security System Effectiveness Evaluation, a Status Report.
J. L. Todd, Jr., and W. C. Nickell. Jul 75, 14p
CONF-750608-12
Contract AT(29-1)-789

Descriptors: (*Physical protection devices, *Efficiency), (*Nuclear facilities, *Security), (*Nuclear materials management, Physical protection devices), Comparative evaluations, Optimization.

For abstract, see NSA 32 08, number 20429.

UCID-16808(Rev.1) PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Systems Analysis of a Security Alarm System.
A. Schiff. 28 May 75, 34p
Contract W-7405-Eng-48

Descriptors: (*Lawrence livermore laboratory, *Physical protection devices), (*Nuclear facilities, Physical protection devices), (*Safeguards, Physical protection devices), (*Alarm systems, *Performance), Security.

For abstract, see NSA 32 08, number 20430.

UCRL-51802(Pt.1) PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Evaluation of Methods for Seismic Analysis of Nuclear Fuel Reprocessing Plants, Part 1.
F. J. Tokarz, R. C. Murray, D. F. Arthur, W. W. Feng, and L. H. Wight. 7 Feb 75, 80p
Contract W-7405-Eng-48

Descriptors: (*Barnwell fuel processing plant, *Seismic effects), (*Fuel reprocessing plants, Seismic effects), Gaseous wastes, Radioactive waste processing, Safety engineering, Spent fuels, Structural models.

For abstract, see NSA 32 08, number 19416.

Y-DJ-17186 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
New Emphasis on Material Accountability'S Role in Special Nuclear Materials Security.
E. F. Gambill. Jun 75, 5p CONF-750608-9

Descriptors: (*Uranium 235, *Accounting), (*Safeguards, *Inventories), (*Y-12 plant, Safeguards), Computers, Data acquisition, Data processing, Material balance, Nondestructive analysis, Optimization.

For abstract, see NSA 32 08, number 20431.

18K. Reactor Physics

AD-A015 781/8GA PC$3.25/MF$2.25
New York Univ N Y Courant Inst of Mathematical Sciences
Neutron Transport and Diffusion in Inhomogeneous Media I,
Edward W. Larsen. 18 Nov 74, 8p Rept no. AFH-21 AFOSR-TR-75-1450
Grant AF-AFOSR-2107-71
Availability: Pub. in Jnl. of Mathematical Physics, v16 n7 p1421-1427 Jul 75.

Descriptors: *Neutron transport theory, *Asymptotic series, Diffusion theory, Homogeneity, Boundary layer, Boundary value problems, Reprints.

The asymptotic solution of the neutron transport equation is obtained for large near-critical domains D which possess a cellular, nearly periodic structure. A typical mean free path in D is taken to be of the same order of magnitude as a cell diameter, and these are taken to be small (of order epsilon) compared to a typical diameter of D. The solution is asymptotic with respect to the small parameter epsilon. It is a product of two functions, one determined by a detailed cell calculation and the other obtained as the solution of a time dependent diffusion equation. The diffusion equation contains precursor (delayed neutron) densities, equations for which are derived. The coefficients in the diffusion equation, which are determined using the results of the cell calculation, differ from those now used in engineering applications. The initial condition for the diffusion equation is derived, and the problem of determining the boundary condition is discussed. (Author)

AEEW-R-1002 PC$6.00/MF$2.25
UKAEA Reactor Group, Winfrith. Atomic Energy Establishment.
Tutank: A Two-Dimensional Neutron Kinetics Code.
M. G. Watts, M. J. Halsall, and F. J. Fayers. Apr 75, 56p
U.S. Sales Only.

Descriptors: (*Thermal reactors, *Reactor kinetics), (*Pwr type reactors, Reactor kinetics), (*Bwr type reactors, Reactor kinetics), (*Computer codes, *T codes), Excursions, Neutron diffusion equation, Two-dimensional calculations.

For abstract, see NSA 32 08, number 21705.

GEAP-14014 PC$5.45/MF$2.25
General Electric Co., Sunnyvale, Calif. Breeder Reactor Dept.
Fondle: A Computer Code for Comparing Experimental and Analytical Data.
S. Crick. Mar 75, 85p
Contract AT(04-3)-893

Descriptors: (*Reaction kinetics, *Three-dimensional calculations), (*Computer codes, *F codes), Criticality, Reactor kinetics.

For abstract, see NSA 32 08, number 21707.

SES/INT/SAI-75-21 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Services d'Electronique.
Integration of Nuclear Reactor Kinetic Equations by Subroutine Neptune and Comparison with Two Classical Integration Methods.
Y. Monsef, and G. Zwingelstein. 4 Feb 75, 13p
In French. U.S. Sales Only.

Descriptors: Computer calculations, Computer codes, Reactor kinetics equations.

For abstract, see NSA 32 08, number 21708.

18N. Snap Technology

AGC-2221 PC$9.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Scale-Model Heat-Transfer Test of the Nerva Nozzle.
Jul 62, 125p
Contract SNP-1

Descriptors: (*Nerva reactor, Nozzles), (*Nozzles, *Heat transfer), Functional models.

For abstract, see NSA 32 08, number 21557.

AGC-2222 PC$9.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Preliminary Stress Analysis Nerva Heated-Bleed Engine.
May 62, 135p
Contract SNP-1

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Stress analysis).

For abstract, see NSA 32 08, number 21558.

AGC-2278 PC$8.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Interim Report: Nerva Engine Thermodynamic Cycle Selection.
23 Oct 62, 110p
Contract SNP-1

Descriptors: (*Nerva reactor, *Thermodynamic cycles), Comparative evaluations, Design, Reliability.

For abstract, see NSA 32 08, number 21559.

AGC-2597 PC$13.00/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Evaluation of Post-Operative Destruct System Concepts.
9 Aug 63, 198p
Contract SNP-1

Descriptors: (*Nerva reactor, *Fragmentation), Chemical explosives, Comparative evaluations.

For abstract, see NSA 32 08, number 21560.

AGC-8207-63-15 PC$13.50/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Nrx-a Aluminum Pressure Vessel S/N 0000002 Hydrostatic Test Structural Evaluation Report.
A. D. Cornell. 1 Oct 63, 208p

Descriptors: (*Nerva reactor, Pressure vessels), (*Pressure vessels, *Testing), Aluminium, Nozzles, Stresses.

For abstract, see NSA 32 08, number 21561.

AI-AEC-Memo-12775 PC$5.25/MF$2.25
Atomics International Div., Canoga Park, Calif.
S8dr Fuel Rod Fabrication.
D. T. McClelland. 29 Jan 69, 43p

Descriptors: (*S8dr reactor, *Fuel elements), Extrusion, Fabrication, Fuel cans, Hastelloy n.

For abstract, see NSA 32 08, number 21562.

LA-5931 PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Review of Fuel Element Development for Nuclear Rocket Engines.
J. M. Taub. Jun 75, 48p

Descriptors: (*Space propulsion reactors, Fuel elements), (*Nerva reactor, Fuel elements), (*Fuel elements, *Design), Fabrication, Performance testing, Research programs, Reviews.

For abstract, see NSA 32 08, number 21563.

NAA-SR-Memo-10234 PC$6.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap 10A Qualification Status Report. Volume II. Component Development and Qualification Test Status, Structure.
21 Sep 64, 60p
Contract AT(11-1)-GEN-8

Descriptors: (*Snap 10 reactor, *Reactor components), Mechanical vibrations, Performance testing, Stress analysis, Supports.

For abstract, see NSA 32 08, number 21566.

NAA-SR-Memo-11462 PC$5.50/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snapshot Briefings Given at Vandenberg Air Force Base Prior to Launch.
W. F. Heine. 30 Jun 65, 48p
Contract AT(11-1)-GEN-8

Descriptors: (*Snap reactors, *Information), Launching, Safety, Specifications.

For abstract, see NSA 32 08, number 21567.

NAA-SR-Memo-11526 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
High Temperature Coil Design.
L. Donelan. 12 Jul 65, 10p

Descriptors: (*Snap reactors, Electric coils), (*Electric coils, *Design), Fabrication, Specifications.

For abstract, see NSA 32 08, number 21568.

NAA-SR-Memo-11574 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Experimental Study of Intrinsic Core Subcriticality by Neutron Spectral Changes.
D. W. Clifford, and S. Yee. 16 Aug 65, 12p

Descriptors: (*Snap 10 reactor, *Reactivity worths), Gadolinium oxides, Neutron flux, Reactor components, Safety engineering.

For abstract, see NSA 32 08, number 21569.

NAA-SR-Memo-11825 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Summary of Analysis of S8er Fission Product Monitoring.
W. C. Miller, and R. H. Vollmer. 21 Jan 66, 12p

Descriptors: (*S8er reactor, *Fission products), Primary coolant circuits, Radiation monitoring, Reactor operation.

For abstract, see NSA 32 08, number 21570.

NAA-SR-Memo-11889 PC$4.25/MF$2.25
Atomics International Div., Canoga Park, Calif.
Effect of Nak on an Artificially Ruptured S8er Fuel Element.
C. J. Engberg, and R. S. Neymark. 23 Mar 66, 23p

Descriptors: (*S8er reactor, *Fuel elements), Cracks, Fuel cans, Fuel-coolant interactions, Hydrogen, Losses, Very high temperature.

For abstract, see NSA 32 08, number 21571.

NAA-SR-Memo-12088 PC$8.75/MF$2.25
Atomics International Div., Canoga Park, Calif.
Evaluation of In-Core Instrumentation for the S8ds Reactor, Phase I.
C. A. Goetz, and E. J. Donovan. 1 Nov 66, 114p

Descriptors: (*S8dr reactor, *In core instruments), Performance testing, Specifications, Thermocouples.

For abstract, see NSA 32 08, number 21572.

NAA-SR-Memo-12368 PC$6.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Electron Microscopy Analysis of Irradiated S8er and Naa 115-1 Fuel.
K. J. Miller. 7 Mar 67, 57p

Descriptors: (*S8er reactor, Fuel elements), (*Snap reactors, Fuel elements), (*Fuel elements, *Physical radiation effects), Electron microscopy, Microstructure, Solid fuels.

For abstract, see NSA 32 08, number 21573.

NAA-SR-Memo-12379 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Techniques for the Remote Replication of Irradiated Snap Fuel (Zirconium--10 W/O Uranium Alloy Hydride).
W. E. Krupp, D. D. McAfee, and L. L. Johnson. 7 Apr 67, 14p

Descriptors: (*Snap reactors, Fuel elements), (*Fuel elements, *Replica techniques), Replicas.

For abstract, see NSA 32 08, number 21574.

NAA-SR-Memo-12384 PC$6.50/MF$2.25
Atomics International Div., Canoga Park, Calif.
Detailed Thermal Analysis of Snap Reactor Fuel Elements Including Asymmetry and Spacing Effects.
P. M. Magee. 20 Mar 67, 66p

Descriptors: (*Snap 8 reactor, *Heat transfer), Configuration, Fuel elements, Liquid flow, Reactor cores, Temperature distribution.

For abstract, see NSA 32 08, number 21575.

NAA-SR-Memo-7550 PC$4.75/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap 10A Snapshot Program Development.
33p

Descriptors: (*Snap 10 reactor, *Reactor components), Specifications.

For abstract, see NSA 32 08, number 21564.

NAA-SR-Memo-9352(Rev.A) PC$10.25/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap 10A Prelaunch Operations Npu Prelaunch Operations-Sptl.
19 Feb 65, 145p
Contract AT(11-1)-GEN-8

Descriptors: (*Snap 10 reactor, *Nuclear facilities), Manuals, Repair, Safety.

For abstract, see NSA 32 08, number 21565.

RAR-652-340-002 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Preliminary Failure Mode and Effect Analysis.
J. V. Addison. 8 Sep 72, 15p

Descriptors: (*Nak cooled reactors, *Failure mode analysis), (*Space power reactors, Failure mode analysis), Pumps, Reactor cooling systems, Thermoelectric generators.

For abstract, see NSA 32 08, number 21576.

RAR-696-13-001 PC$4.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Reliability Analysis of Zrh Reactor Thermoelectric System.
D. S. Burgess. 29 May 68, 17p

Descriptors: (*Space power reactors, *Reliability), (*Hydride moderated reactors, Reliability), Reactor components, Thermoelectric generators.

For abstract, see NSA 32 08, number 21577.

RN-DR-0148 PC$5.2[illegible]/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Technical and Programmatic Requirements.
Feb 68, 43p
Contract SNP-1

Descriptors: (*Nerva reactor, *Reactor components), (*Research programs, *Planning), Specifications, Testing.

For abstract, see NSA 32 08, number 21579.

RN-S-0026(Vol.1) PC$13.75/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Nerva Program Design Review Presentation to Snpo on 13--15 November 1963. Volume I.
30 Jan 64, 215p

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Design), (*Reactor control systems, Design).

For abstract, see NSA 32 08, number 21580.

RN-S-0026(Vol.5) PC$12.50/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Nerva Program Design Review Presentation to Snpo on 13--15 November 1963. Volume V.
30 Jan 64, 190p

Descriptors: (*Nerva reactor, Test facilities), (*Test facilities, *Design), Planning.

For abstract, see NSA 32 08, number 21581.

RN-S-0062 PC$4.00/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Tpa Presentation, Snpo-C.
Feb 64, 29p

Descriptors: (*Nerva reactor, *Pumps), Performance.

For abstract, see NSA 32 08, number 21582.

RN-S-0072 PC$7.25/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Status Report for Bi-Functional Destruct System.
Apr 64, 81p
Contract SNP-1

Descriptors: (*Nerva reactor, *Fragmentation), Design, Engineered safety systems.

For abstract, see NSA 32 08, number 21583.

RN-S-0073 PC$7.25/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Bendix Tpcv Actuator Presentation.
19 Mar 64, 83p
Contract SNP-1

Descriptors: (*Nerva reactor, *Actuators), Pumps, Valves.

For abstract, see NSA 32 08, number 21584.

RN-S-0074 PC$4.25/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Mark III Tpa Stability Analysis.
19 Mar 64, 24p
Contract SNP-1

Descriptors: (*Nerva reactor, Pumps), (*Pumps, *Stability), Instability.

For abstract, see NSA 32 08, number 21585.

RN-S-0134 PC$8.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Preliminary Report on Nuclear Radiation Heating of Components in the Nerva Engine.
Apr 65, 107p
Contract SNP-1

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Radiation heating), Computer calculations.

For abstract, see NSA 32 08, number 21586.

RN-S-0154 PC$9.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.

Aec-NASA Space Nuclear Propulsion Office Preliminary Advanced Engine Studies (Nerva-II).
Dec 64, 127p
Contract SNP-1

Descriptors: (*Nerva reactor, *Design), Feasibility studies.

For abstract, see NSA 32 08, number 21587.

RN-S-0215 PC$5.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nrx-A2 Nozzle-Chamber, Tungsten--Rhenium Thermocouples.
May 65, 54p

Descriptors: (*Nrx-a2 reactor, *Thermocouples), Nozzles, Performance.

For abstract, see NSA 32 08, number 21588.

RN-S-0220 PC$8.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Assembly and Brazing of Nerva U-Tube Nozzles.
Oct 65, 115p

Descriptors: (*Nerva reactor, Nozzles), (*Nozzles, *Brazing), Testing.

For abstract, see NSA 32 08, number 21589.

RN-S-0289A PC$19.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Xe-Engine Systems Analysis Design Data Book.
Apr 67, 317p
Contract SNP-1

Descriptors: (*Xe-prime reactor, *Systems analysis), Data, Design, Mathematical models.

For abstract, see NSA 32 08, number 21590.

RN-S-0486(Vol.2) PC$5.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Xe-1 Cam Equation Derivation.
Oct 68, 36p
Contract SNP-1

Descriptors: (*Nerva reactor, *Mathematical models), Fluid flow, Reactor kinetics, Reactor operation.

For abstract, see NSA 32 08, number 21591.

RN-64010 PC$6.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Experimental and Analytical Studies of Nuclear Exhaust Systems.
Aug 64, 56p
Contract SNP-1

Descriptors: (*Nerva reactor, *Exhaust gases), Ducts, Functional models, Test facilities.

For abstract, see NSA 32 08, number 21578.

SC-RR-72-0814 PC$6.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Shock Response of Distended CVD Carbon Felt.
L. M. Lee. Dec 72, 61p

Descriptors: (*Nerva reactor, *Thermal insulation), (*Carbon, *Wave propagation), Attenuation, Impact shock.

For abstract, see NSA 32 08, number 21592.

TI-759-240-031 PC$5.50/MF$2.25
Atomics International Div., Canoga Park, Calif.
Fuel Element Vibration Study: Design and Analysis of a Pre-Kinked Column Buckling Device.
R. V. Anderson. 3 Mar 71, 44p

Descriptors: (*Snap reactors, *Fuel elements), Deformation, Mechanical vibrations, Performance testing, Specifications.

For abstract, see NSA 32 08, number 21593.

TID/SNA-1400 PC$6.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Mechanical Irradiation Test 3/L002 Turbopump Bearing Set. Final Test Report 1.9.5-5E.
F. E. Young. 20 Mar 64, 56p

Descriptors: (*Nerva reactor, Pumps), (*Bearings, *Physical radiation effects), (*Pumps, Bearings), Low temperature, Radiation heating.

For abstract, see NSA 32 08, number 21594.

TID/SNA-1402 PC$4.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Materials Selection for Task 13 Hot-Bleed Radiation-Cooled Skirt Application, Nerva.
S. E. Adair. 26 Dec 61, 15p
Contract SNP-1

Descriptors: (*Nerva reactor, Nozzles), (*Nozzles, *Heat resisting alloys), Coatings, Reactor materials.

For abstract, see NSA 32 08, number 21595.

TID/SNA-1404 PC$4.50/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Steady State Temperature Profile of Nrx-al Aluminum Pressure Vessel Assembly, Report No. 9443-63-1.
E. A. Thomas. 15 Apr 64, 30p
Contract SNP-1

Descriptors: (*Nrx-a1 reactor, *Pressure vessels), Computer calculations, Radiation heating, Temperature distribution.

For abstract, see NSA 32 08, number 21596.

TID/SNA-1408 PC$5.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Design of a Cryogenic Two Point Liquid Level Controller.
C. A. Henson. 10 Mar 64, 36p

Descriptors: (*Nerva reactor, *Control equipment), Cryogenics, Design, Electronic equipment, Helium, Level indicators, Oxygen.

For abstract, see NSA 32 08, number 21597.

TID/SNA-1409 PC$6.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Mechanical Irradiation Test 3/L003 Turbopump Bearing Set.
F. E. Young. 23 Apr 64, 59p

Descriptors: (*Nerva reactor, Pumps), (*Pumps, Bearings), (*Bearings, *Physical radiation effects), Astr reactor, Very low temperature.

For abstract, see NSA 32 08, number 21598.

TID/SNA-1411 PC$4.00/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Nerva Gimbal Development Program Plan 9626-63-1.
R. B. Wright. 15 Feb 63, 11p

Descriptors: (*Nerva reactor, Control equipment), (*Control equipment, *Design), Stress analysis.

For abstract, see NSA 32 08, number 21599.

TID/SNA-1412 PC$4.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Electrical Irradiation Test 23/L501 Pressure Transducers: Final Test Report 1.9.5-2E. Volume II.
T. C. Robb. 10 Apr 64, 23p

Descriptors: (*Nerva reactor, Transducers), (*Transducers, *Radiation effects), Gtr reactor.

For abstract, see NSA 32 08, number 21600.

TID/SNA-1414 PC$4.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Electrical Irradiation Test No. 23/L001 Piezoelectric and Strain Gage-Type Accelerometers: Final Test Report No. 1.9.5-2E. Volume I.
T. C. Robb. Mar 64, 24p

Descriptors: (*Nerva reactor, Accelerometers), (*Accelerometers, *Radiation effects), Gtr reactor.

For abstract, see NSA 32 08, number 21601.

TID/SNA-1416 PC$5.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Mechanical Irradiation Test No. 1/L001 Tank Shut-off Valve, Configuration No. 1. Volume II.
M. H. Warner. Feb 64, 45p

Descriptors: (*Nerva reactor, Valves), (*Valves, *Physical radiation effects), Astr reactor, Seals, Very low temperature.

For abstract, see NSA 32 08, number 21602.

TID/SNA-1417 PC$5.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Mechanical Irradiation Test No. 4/L001. Volume III. Turbine Power Control Valve Configuration No. 1.
M. H. Warner. Feb 64, 43p

Descriptors: (*Nerva reactor, Valves), (*Valves, *Physical radiation effects), Astr reactor, Seals, Very low temperature.

For abstract, see NSA 32 08, number 21603.

TID/SNA-1418(V.4) PC$5.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
Mechanical Irradiation Test No. 8/L001, Static Flange Seal Assembly. Final Test Report No. 1.9.5-1E, Volume 4.
M. H. Warner. 16 Mar 64, 41p

Descriptors: (*Nerva reactor, Flanges), (*Seals, *Physical radiation effects), (*Flanges, Physical radiation effects), Astr reactor, Low temperature.

For abstract, see NSA 32 08, number 21604.

TID/SNA-3025 PC$5.00/MF$2.25
Aercjet Liquid Rocket Co., Sacramento, Calif.
Kiwi-B Test Report 9660-003.
R. B. Wright. 31 Jan 64, 39p

Descriptors: (*Kiwi reactors, Nozzles), (*Nozzles, *Testing), Failures, Simulation, Thermal shock.

For abstract, see NSA 32 08, number 21605.

WANL-PR(J)-055 PC$11.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.

Nerva Nuclear Subsystem. Summary Progress Report, 1 October 1968--30 September 1969.
24 Oct 69, 163p

Descriptors: (*Xe-prime reactor, *Performance testing), (*Fuel elements, *Research programs), (*Nerva reactor, *Design), Data acquisition systems, Mathematical models, Nuclear facilities, Phoebus-2a reactor, Test facilities, Transfer functions, Xe-2 reactor.

For abstract, see NSA 3208

WANL-PR(J)-056 PC$10.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nerva Nuclear Subsystem. Progress Report, 1 October 1969--31 December 1969.
25 Jan 70, 151p

Descriptors: (*Nerva reactor, *Specifications), (*Test facilities, *Safety), (*Radiation effects, *Research programs), Actuators, Design, Reliability, Scrubbers.

For abstract, see NSA 3208

WANL-TME-018 PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Radiation Environment around Shielded and Unshielded Kiwi B-1 Reactor.
25p

Descriptors: (*Kiwi-b1a reactor, *Radiation doses), Shielding.

For abstract, see NSA 32 08, number 21608.

WANL-TME-020 PC$10.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Dose Rates from an Unshielded Engine.
L. O. Ricks. 6 Mar 62, 4p

Descriptors: (*Phoebus-1a reactor, *Radiation doses), Gamma radiation, Reactor shutdown.

For abstract, see NSA 32 08, number 21609.

WANL-TME-1100 PC$6.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A3 Element Placement and Orificing Summary Report.
R. B. Phillips. 19 Feb 65, 70p

Descriptors: (*Nrx-a3 reactor, *Fabrication), Configuration, Fuel elements, Orifices, Reactor cores.

For abstract, see NSA 32 08, number 21617.

WANL-TME-1240 PC$4.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Calibration of Instrumented Lateral Support Springs and Tie Rods for Nrx-A4 (Est).
J. M. Sucevic. Aug 65, 26p

Descriptors: (*Nrx-a4-est reactor, *Reactor core restraints), Nerva reactor, Springs, Strain gages.

For abstract, see NSA 32 08, number 21618.

WANL-TME-1267 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Power Perturbations in Coupled Reactor Systems.
A. L. Mowery, and H. C. Romesburg. Sep 65, 15p

Descriptors: (*Nerva reactor, Coupled reactor cores), (*Coupled reactor cores, *Power distribution), Disturbances, Neutron flux tilting, Rover reactors.

For abstract, see NSA 32 08, number 21619.

WANL-TME-190 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
B6 Reactor Meeting at Wanl on November 7 and 8, 1962.
12 Nov 62, 5p

Descriptors: (*Kiwi reactors, *Planning), Afterheat removal, Containers, Design, Reactor components, Reactor materials, Reactor startup.

For abstract, see NSA 32 08, number 21610.

WANL-TME-2005 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Engineering Critical Component Specification, Part 1. Performance/Design and Qualification Requirements. Cluster Hot End Support Hardware for Nerva Nuclear Subsystem.
15 May 68, 16p

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Specifications), Design.

For abstract, see NSA 32 08, number 21620.

WANL-TME-2011 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Engineering Critical Component Specification, Part I. Performance/Design and Qualification Requirements. Lateral Support System for Nerva Nuclear Subsystem.
15 May 68, 16p

Descriptors: (*Nerva reactor, *Supports), Specifications.

For abstract, see NSA 32 08, number 21621.

WANL-TME-2012 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Engineering Critical Component Specification, Part I. Performance/Design and Qualification Requirements. Core Periphery for Nerva Nuclear Subsystem.
15 May 68, 16p

Descriptors: (*Nerva reactor, *Reactor components), Reactor cores, Specifications.

For abstract, see NSA 32 08, number 21622.

WANL-TME-213 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Residual Activity of Test Cell a Complex after an Nrx Test.
L. O. Ricks. 19 Nov 62, 1p

Descriptors: (*Nerva reactor, Test facilities), (*Test facilities, *Radiation doses), Neutron reactions.

For abstract, see NSA 32 08, number 21611.

WANL-TME-257 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Thermocouple, Resistance Thermometer and Strain Gage Transducer Development Plans and Candidate Transducer Data Sheets for Inclusion into Nerva Instrumentation Data Book.
R. L. Ramp. 19 Jan 63, 19p

Descriptors: (*Nerva reactor, *Reactor instrumentation), Data, Research programs, Strain gages, Thermocouples, Thermometers, Transducers.

For abstract, see NSA 32 08, number 21612.

WANL-TME-567 PC$4.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Evaluation of Three Candidate Cluster Plate Materials.
A. Filippi. 18 Oct 63, 33p

Descriptors: (*Nerva reactor, *Neutron absorbers), (*Stainless steels, *Mechanical properties), (*Silver base alloys, Mechanical properties), Boron additions, Cadmium alloys, Indium alloys, Physical radiation effects, Reactor materials, Tin alloys.

For abstract, see NSA 32 08, number 21613.

WANL-TME-574(Rev.1) PC$5.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nuclear Data Library for the Fission Product Program.
M. R. Trammell, and W. A. Henniger. 17 Nov 66, 52p

Descriptors: (*Nerva reactor, Fission products), (*Fission products, *Data compilation), Atomic number, Beta spectra, Decay, Fission yield, Gamma spectra, Half-life, Mass number, Nuclear data collections, Uranium 235.

For abstract, see NSA 32 08, number 21614.

WANL-TME-679(Pt.2) PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Gadolinium--Stainless Steel Development. Part II.
J. A. Begley. 7 Feb 64, 43p

Descriptors: (*Nerva reactor, *Neutron absorbers), (*Stainless steels, *Fabrication), Gadolinium additions, Mechanical properties, Powder metallurgy, Reactor components, Testing.

For abstract, see NSA 32 08, number 21615.

WANL-TME-804 PC$9.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A2 Activation Analysis Report.
L. D. Stephenson, and F. Planinsek. Aug 64, 133p

Descriptors: (*Nrx-a2 reactor, *Residual power), Fission products, Gamma radiation, Neutron reactions, Radiation doses, Radioactivation, Reactor materials, Reactor shutdown.

For abstract, see NSA 32 08, number 21616.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A015 895/6GA PC$3.75/MF$2.25
New Mexico Univ Albuquerque Eric H Wang Civil Engineering Research Facility

Mechanical Property Evaluation of Explosive Boards for High-Explosive Simulation Technique Applications.
Final rept. Mar 73-Oct 74,
Jon B. Anderson. Jul 75, 42p AFWL-TR-74-104
Contract F29601-72-C-0024

Descriptors: *High explosives, *Honeycomb structures, Mechanical properties, Loads(Forces), PETN, Cavities, Binders, Deflection.
Identifiers: *Explosive boards, High explosive simulation techniques.

The high cost of the present method of explosive placement in HEST type tests led to the examination of explosive boards as a possible solution to this economic problem. The main objective was to find the maximum distances that these boards could span, supporting their own weight, and applying a safety factor of 2. These results were then applied to HEST cavity explosive spanning distances. Two types of explosive boards were available for testing--the Ensign-Bickford and the Thiokol boards. These boards were placed in a test frame and loaded to failure. The total load, distance spanned, and weight of board data determined the maximum spanning distances. The Ensign-Bickford board will span 8.17 ft in its weak direction (maximum span using a safety factor of 2); the spanning capability should be greater in the strong direction. The Thiokol board is isotropic and will span 14.23 ft with a safety factor of 2. Therefore, both boards will span the required HEST distances with the appropriate safety factor.

AD-A015 987/1GA PC$4.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
Smoke Seminar, 20 August 1974.
Special pub.,
Malcolm G. Gordon. Jun 75, 75p Rept no. ED-SP-75003

Descriptors: *Smoke munitions, *Meetings, Smoke bombs, Smoke projectiles, Smoke screens, Chaff dispensers, Obscuration, Infrared scanning, Attenuation, Aerosols.

This publication contains the written reports of those presentations given at a Smoke Seminar held on 20 August 1974 at Edgewood ARsenal, Aberdeen Proving Ground, Maryland. The Seminar was held under the direction of the Munitions Systems Division, Development and Engineering Directorate, with the objectives of providing a forum for the discussion and exchange of ideas on broad spectrum smoke screening. It was anticipated that the informational exchange would identify current capabilities and technological pacing problems and place user requirements in a clearer perspective. The presentations discussed such subjects as aerosol IR attenuation, obscuration measurement, color specification, current smoke requirements and capabilities, and new smoke weapons. Color illustrations reproduced in black and white.

AD-A016 025/9GA PC$4.25/MF$2.25
Naval Surface Weapons Center Dahlgren Lab Va
The Ultransonic Inspection of Cast Explosive Billets.
Final rept.,
Gerald V. Blessing, and Jeffrey M. Warren. Sep 75, 72p Rept no. NSWC/DL-TR-3332

Descriptors: *Explosives, *Casting, *Billets(Materials), *Ultrasonic inspection, Nondestructive testing, Cavities, Defects(Materials), Acoustic attentuation.
Identifiers: PBXN-16 cast explosives.

The development of an ultrasonic inspection capability to detect air voids in PBXN-106 cast explosive billets is described. Begining with feasibility tests, the evolution of a suitable technique through research and development has culminated in the design and fabrication of an assembly-line prototype system. Principal attention is given to the technical development portion of the program. The choice of optimum ultrasonic transducers for both transmission and reflection, and the associated electronics hardware is described. A critical analysis of focused transducers, transducer bandwidth, and couplant materials is presented, in addition to the ultrasonic frequency dependence of the energy attenuation in the explosive. Several methods of hard-copy production for permanent flaw recording are described. Atuomatic gain control of the output signal is discussed for applications to a completely automated recording system. Finally, on-line tests results are given to compare the flaw detection capability of the ultrasonic system to that of X-ray.

AD-A016 098/6GA PC$8.50/MF$2.25
Picatinny Arsenal Dover N J
Safety Engineering and Protective Technology in Support of Army Modernization Programs--Picatinny Arsenal Papers Presented at the 16th Annual Explosive Safety Seminar.
Aug 75, 269p Rept no. PA-TR-2157

Descriptors: *Explosives, *Storage, *Safety, *Explosive ordnance disposal, *Meetings, Ammunition, Explosions, Blast loads, Fluidized bed processes, Incinerators, Hazards, Pollution.
Identifiers: Quantity distance ratio.

Comprehensive programs of technology development in the safety engineering and pollution abatement fields are being carried out by the US Army. The purpose is to provide support to its munitions production base modernization and expansion program. This report contains nine papers concerning eight selected safety engineering technology development efforts and one on waste explosive and propellant disposal by incineration techniques that provide minimal air and water pollution. These papers were presented at the 16th DOD Explosive Safety Seminar (September 1974).

AD-A016 104/2GA PC$5.25/MF$2.25
Army Armament Command Rock Island Ill Cost Analysis Div
Ammunition Cost Research: Medium-Bore Automatic Cannon Ammunition.
Technical rept.,
Patrick Gannon, Celestino George, Gerald Kalal, Kathleen Keleher, and Paul Riedesel. Oct 75, 107p Rept no. AMSAR-CPE-75-6

Descriptors: *Ammunition, *Ammunition components, *Cost analysis, Automatic weapons, Cost estimates, Procurement, Production engineering, Statistical analysis.
Identifiers: *Cost estimating relationships, *Cost models.

At the complete round level of detail, statistically valid cost estimating relationships (CER's) for independent parametric cost estimates of ammunition investment costs have been difficult to construct. The long life span of ammunition items reduces the number and range of data points available for a given weapon system class (e.g., tank main armament). To counter this problem, a research project has been undertaken to relate physical round performance to component cost (primers, propellants, projectiles, etc.). The report for medium-bore automatic gun ammunition represents the first of three reports resulting from this project. This report demonstrates how component-level CER's and cost models can be used to independently estimate ammunition investment costs with much greater statistical validity than has been obtained with past approaches.

AD-A016 110/9GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J
Detection of Base Separation in 175mm Artillery Shell by Gamma-Ray Transmission.
Technical rept.,
J. McCahill, A. Jentsch, S. Watters, and S. Helf. Sep 75, 25p Rept no. PA-TR-4852

Descriptors: *Projectiles, *Nondestructive testing, *Gamma rays, Projectile cases, Explosives, Separation, Feasibility studies.
Identifiers: 175-MM projectiles, Base separation.

The feasibility of gamma-ray transmission to inspect for base separation between the steel shell and the high explosive casting in 175 mm projectiles was explored. The method consists of passing the section of the projectile containing the metal base-explosive interface across a highly collimated beam of cobalt-60 gamma rays and measuring changes in transmission with a scintillation detector. It is demonstrated both theoretically and experimentally that a 30-mil (0.030 in.) gap can be detected using rigidly controlled laboratory conditions with a mock projectile and an artifically induced separation. This technique was also tested with 100 fully loaded projectiles.

AD-A016 112/5GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
Inertial Properties of Symmetric Sabot Components.
Final rept.,
George D. Kahl, and David B. Sleator. Aug 75, 25p Rept no. BRL-1812

Descriptors: *Sabot projectiles, *Sabots, Moment of inertia, Pendulums, Tensors, Vector analysis, Ballistic testing.
Identifiers: M-735 projectiles, XM-735 projectiles.

A simple method is described for experimentally finding the principal moments of inertia and the directions of the principal axes for a rigid body with only one known plane of symmetry in mass distribution. The torsion pendulum method is used, although this method is generally applicable only when a principal axis of the body coincides with the gravity direction. A rapidly converging process is demonstrated for obtaining accurate data, without the above restriction which serves to locate the orientation of all principal axes. The technique was tested against known bodies, and then used to find the inertial properties of a typical sabot component for the XM 735 projectile.

AD-A016 119/0GA PC$7.25/MF$2.25
TRW Inc Philadelphia Pa
Production Engineering Measure for Thin Film Ratiometer.
Final engineering rept. 29 Jun 73-10 Jul 75,
Harry B. Casey. 22 Aug 75, 225p
Contract DAAB05-73-C-2077
See also report dated 18 Apr 75, AD-A011 286.

Descriptors: *Electric fuzes, *Proximity fuzes, *Timing devices, Manufacturing, Production engineering, Thin films, Specifications, Test methods, Quality control, Fabrication, Fuze functioning elements.
Identifiers: *Ratiometers, *Production engineering measures, Photoresist techniques, M-732 fuzes, XM-732 fuzes.

This report covers device description, technical and manufacturing analyses, manufacturing procedures, and quality control criteria. The work accomplished demonstrates that the processes and manufacturing methods, developed for the production of thin film ratiometer elements fabricated as a detonator block assembly, provide a technically acceptable product.

AD-A016 139/8GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Meeting of the NATO AC/258/EED Subgroup at Toulon on 25, 26, 27 February 1975,
F. Cantrell. 7 May 75, 20p Rept no. FTD-HC-23-1144-75
Edited trans. of mono. Direction des Constructions et Armes Navales, Toulon, 24 Feb 75, p1-9.

Descriptors: *Pyrotechnics, *Electric fields, Electromagnetic fields, Power spectra, Electromagnetic radiation, Radio transmission, Radar transmitters, Shipboard, Translations.
Identifiers: Electropyrotechnic devices.

No abstract available.

AD-B002 607/0GA PC$3.25/MF$2.25
Naval Weapons Center, China Lake, Calif.
The Effect of Illuminating Flare Color on Target Acquisition.
Technical rept. Jan-Nov 74,
Robert L. Hilgendorf, Edwin H. Sasaki, and Ronald A. Erickson. Feb 75, 22p NWC-TP-5729
Distribution limitation now removed.

Descriptors: *Colored flares, *Visual perception, Surface targets, Air to surface, Performance(Human), Vegetation, Buildings, Target recognition, Searching, Detection, Trucks, Slant range, Range(Distance), Terrain, Haze, Simulation, Colors, Camouflage, Green, Red color, Yellow, White light, Acceptability, Illumination, Contrast, Target acquisition.
Identifiers: Olive green.

A laboratory experiment was conducted on the effect of flare color on target acquisition performance. Subjects were required to search for olive drab model vehicles located on a model of European type terrain. The model consisted of cultural features and predominantly green vegetation. The model was illuminated by one simulated flare whose color was either red, green, yellow, or white.

PAT-APPL-554 358/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Method for Reclaiming and Recycling Plastic Bonded Energetic Material.
Patent Application,
Charles W. Falterman, Fred Menz, Wallace E. Silver, and Pearsie S. Wiggins. Filed 3 Mar 75, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Plastic bonded explosives, *Recycled materials, Patents, Warheads, Detonating cord, Explosive charges, Shock waves.
Identifiers: *Patent applications, PAT-CL-260-2-3.

The patent application relates to a method whereby the plastic bonded explosive in obsolete or otherwise rejected warheads is explosively shocked out of the warheads so that materials from which the explosive is made can be recycled. The process involves placing detonating cord in a cavity left by the removal of the warhead's safe and arm mechanism and/or communications hole, pouring water into the cavity around the detonating cord and detonating the detonating cord.

19B. Bombs

PAT-APPL-458 141/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Bomb Rack Sway Brace Assembly.
Patent Application,
Curtis K. Baker. Filed 5 Apr 74, 18p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Bomb racks, *Supports, Patents, Bolts, External stores, Ball joints.
Identifiers: PAT-CL-89-1-5, *Patent applications, *Sway braces.

The patent application relates to a single station bomb rack which includes two cantilevered sway brace arms each provided with two oppositely placed sway bolts. The sway brace arms are shaped to accomodate a variety of store shapes and each of the sway brace arms acts in a spring-like fashion under loading. The sway bolts are each provided with internal springs which assure continuous pad-to-store contact. Each sway bolt is provided with a force indicating means which signals that sufficient force has been applied to the sway bolt thereby preventing unnecessary down-hook forces on the bomb rack hook.

19C. Combat Vehicles

AD-A016 106/7GA PC$3.25/MF$2.25
Army Tank-Automotive Command Warren Mich
Development of Urethane Roadwheel Tires with Emphasis on Method of Bonding (First Six Samples).
Final rept. Dec 74-Jul 75,
John W. Cameron. Jul 75, 25p Rept no. TACOM-TR-12092

Descriptors: *Tracked vehicles, *Roadwheels, *Polyurethane resins, *Bonding, Fabrication, Polyester fibers, Aluminum, Welding, Wear resistance.
Identifiers: M-113 vehicles, Expanded metal, Polyether resins.

This project is a test of M113 roadwheels made with urethane tires. Various methods of bonding solid urethane tires to roadwheels for tracked vehicles were evaluated. Mechanical bonding through expanded metal welded to wheel rim looks promising and will be further evaluated through additional drum tests with urethane of different durometer hardness. 5298

19D. Explosions, Ballistics, and Armor

AD-A015 839/4GA PC$3.25/MF$2.25
Goettingen Univ (West Germany) Institut Fuer Physikalische Chemie
Influence of Various Parameters on Initiation, Stability, and Limits of Detonations.
Interim rept. no. 2, 1 Jun 74-31 May 75,
W. Jost, and H. G. Wagner. 31 Jul 75, 9p AFOSR-TR-75-1372
Grant AF-AFOSR-2541-73
See also rept. dated 15 Nov 74, AD-A004 785.

Descriptors: *Detonations, *Flame propagation, Flames, Acceleration, Turbulent flow, West Germany.

The propagation of spherical flames has been investigated under conditions where artificial turbulence was generated by spherical grids at a certain distance from the center. The flame propagation velocity increases when the flame passes the net. The increase of flame velocity depends on laminar flame speed, mesh size of the grid and diameter of the wire of the grid. There exists a lower limit of the Reynolds-number below which no flame acceleration occurs.

AD-A016 252/9GA PC$3.75/MF$2.25
Naval Weapons Center China Lake Calif
The Impedance Mirror Technique for Measuring Detonation Reaction Times.
Interim rept.,
H. Dean Mallory. Sep 75, 26p Rept no. NWC-TP-5794

Descriptors: *Detonations, *Detonation waves, *Recording systems, Reaction kinetics, Streak cameras, Reaction time, Data acquisition, High speed photography.
Identifiers: *Impedence mirrors.

An experimental technique is described by which detonation reaction zone structure is rendered visible in high-speed photographs. Using the time-resolving streak camera, the technique yields both induction and reaction times when these separate zones are present. Data on detonating 75/25 nitromethane/acetone solutions are presented showing good correlation with the Soviet electromagnetic method of measurement. This new technique is more flexible than the electromagnetic method and can yield more data.

AD-A016 259/4GA PC$5.25/MF$2.25
Physics International Co San Leandro Calif
Modeling of Cratering, Close-In Displacements, and Ejecta.
Final rept. 2 Jan-30 Aug 74,
D. Maxwell, and K. Seifert. 16 Jul 75, 108p Rept no. PIFR-659-2 DNA-3628F
Contract DNA001-74-C-0151

Descriptors: *Surface burst, *Cratering, *Ejecta, Explosion effects, Steady state, Kinetic energy, Finite difference theory, Stress strain relations, Model tests.

The cratering flows observed in ten computed surface burst cases were modeled to predict time-dependent cratering, displacements, and ejecta. An elastic perfectly plastic material assumption was then used in conjunction with energy balance assumptions to predict final crater sizes and shapes and to expose the roles played by material strength and gravity. Reasonable agreements were found for a variety of cases.

N75-30466/7GA PC$7.00/MF$2.25
Victoria Univ. (British Columbia).
Photogrammetry of the Shock Front Trajectories on Dipole West Shots 8, 9, 10 and 11.
J. M. Dewey, D. Classen, and D. Mcmillin. Jul 75, 188p UVIC-PF-1-75

Descriptors: *Detonation, *Explosives, *Photogrammetry, *Shock fronts, *Trajectory analysis, Ballistics, Explosions, Hydrostatic pressure, Shock wave propagation, Tables (Data).

For abstract, see STAR 1321

19E. Fire Control and Bombing Systems

AD-A016 165/3GA PC$3.75/MF$2.25
Frankford Arsenal Philadelphia Pa
Laser Rangefinding Techniques for Helicopter Fire Control Applications. Phase I. Hardmounted Laser Concept.
Final test rept. Oct 73-Oct 74,
Albert C. Cappiella. Jan 75, 37p Rept no. FA-TR-75024

Descriptors: *Helicopters, *Fire control systems, *Range finding, *Lasers, Fire control system components, Slant range, Accuracy, Radar range calibrators.
Identifiers: *Laser range finders, *Hard mounted, H-1 aircraft, AH-1G aircraft, Huey Cobra.

The concept of hardmounting a laser rangefinder to a helicopter airframe and having the pilot obtain the range to target by pointing the aircraft, was evaluated. The overall results indicate that this technique produced range errors of approximately 10% over all altitudes (300 ft. to 2500 ft.). The evaluation showed the

range error to increase significantly as operational altitude decreased. This was due to small angular pointing errors translating into large horizontal miss distances when small grazing angles are incurred. Range errors of 20-25% were projected at 50-100 ft. altitudes. It was also determined that last pulse return logic produced smaller range errors than first pulse return logic.

19F. Guns

AD-A016 166/1GA PC$3.25/MF$2.25
Watervliet Arsenal N Y
The Estimation of Yield Strength from Hardness Measurements.
Technical note,
Richard S. DeFries. Aug 75, 21p Rept no. WVT-TN-75051

Descriptors: *Gun barrels, *Steel, Yield strength, Hardness, Estimates.
Identifiers: Steel 4340.

Data are presented to show that the yield strength of gun steel and AISI 4340 alloy can be estimated from Rockwell hardness measurements. The expression, YS = 4.226(R sub c), where YS is the 0.1% offset yield strength in ksi and (R sub c) is the Rockwell C hardness of the material, was developed statistically to fit the data. It is shown that the yield strength within a gun tube forging can be estimated from the hardness measurements taken on a small flat area ground on the OD of the gun tube.

20. PHYSICS

20A. Acoustics

AD-A015 709/9GA PC$3.75/MF$2.25
Washington Univ Seattle Applied Physics Lab
A Simplified Model of the Spectral Characteristics of High Frequency Surface Scatter.
Final technical rept.,
Robert L. Swarts, and Christian J. Eggen. 20 Aug 75, 27p Rept no. APL-UW-7512
Contract N00014-75-C-1010

Descriptors: *Acoustic scattering, *Ocean surface, Standing waves, Plane waves, Computations, Numerical analysis, Surface waves, Backscattering.

Classical wave theoretical treatments can be used to predict the general characteristics of the acoustic field scattered from a roughened time-varying sea surface. Various approximations can then be invoked to handle the so-called slightly rough and very rough surface cases. In this paper an expression for the spectrum of the scattered sound is derived for the very rough case in terms of specific surface wave parameters. This expression is then evaluated for several surface spectra, including the fully aroused Neuman-Pierson and Pierson-Moskowitz surface wave spectra. Finally, these results for special cases of the Neuman-Pierson spectra are compared with those obtained by numerically integrating the general form for the same spectra, a technique that does not involve the very rough case approximation.

AD-A015 735/4GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
A-Weighted Sound Levels in Cockpits of Fixed- and Rotary-Wing Aircraft.
Progress rept. Dec 72-Dec 74,
Donald C. Gasaway. Aug 75, 27p Rept no. SAM-TR-75-22

Descriptors: *Aircraft noise, *Hearing, Conservation, Flight crews, Pilots, Background noise, Intensity, Cockpits, Military aircraft, Rotary wing aircraft, Voice communications, Interference, Engine noise, Level(Quantity), Acoustic measurement, Fatigue(Physiology), Deafness, Risk, Losses, Headgear, Flight helmets, Aviation medicine, Helicopters.
Identifiers: Fixed wing aircraft.

Noise measurements obtained within the cockpits of 339 fixed- and rotary-wing aircraft during normal cruise are reported. The sample includes 271 fixed-wing and 68 rotary-wing aircraft that are grouped according to type and number of power plants. Mean A-weighted levels ranged from 92 to 105 dB for fixed-wing vehicles and from 98 to 106 dB for helicopters. Means and standard deviations are reported by octave-bands, all-pass (flat), A-levels, and preferred speech interference levels (PSIL, average of 500, 1000 and 2000 Hz). Also, at-the-ear A-levels are reported for generalized amounts of attenuation provided by headsets commonly worn in aircraft. (Author)

AD-A015 869/1GA PC$3.25/MF$2.25
Defence Research Establishment Pacific Victoria (British Columbia)
Some Results on Ray-Acoustic Intensity Calculations.
Technical memo.,
Robert F. MacKinnon, and Mary Nell. May 75, 26p Rept no. DREP-TM-75-4

Descriptors: *Acoustics, Intensity, Differential equations, Sound transmission, Reflection, Ray tracing, Numerical analysis.

From the differential equations governing variables sufficient for the calculation of geometric ray acoustic intensity in a horizontally stratified medium, deductions can be made concerning the properties of the acoustic intensity field due to a point source. An investigation is made of the relationship between the intensity at a receiver from a given point source and the intensity when source and receiver positions are interchanged. It is shown that the intensity in the one situation is equal to that in the other times the ratio of the squares of the sound speeds at the two depths, provided that reflections are from perfectly reflecting horizontal surfaces and that the profile of the speed of sound is continuous to the first derivative. A simple general relationship between intensities does not exist if either of these conditions is not met. Secondary investigations are made relevant to the numerical computation of intensities. (Author)

AD-A016 024/2GA PC$5.25/MF$2.25
Tennessee Univ Knoxville Ultrasonics Lab
Amplitude and Phase of Rayleigh-Angle Reflections of Gaussian Ultrasonic Beams Incident on Liquid/Solid Interfaces.
Technical rept.,
Gerald W. Scott. Sep 75, 113p Rept no. TR-13
Contract N00014-71-A-0121-0001

Descriptors: *Ultrasonic radiation, *Rayleigh waves, *Interfaces, *Acoustic reflection, Liquids, Solids, Acoustic equipment, Angles, Gaussian noise, Aluminum, Stainless steel, Alumina, Water, Goniometers, Mathematical analysis, Theses.

The reflected field generated by a bounded ultrasonic beam incident from a liquid onto the plane surface of a solid at the Rayleigh angle was measured with an immersible acoustic goniometer. Incident beams with gaussian amplitude profiles were generated by apodizing the electric field across the transmitting crystal with a metal-strip electrode behind the crystal. The incident beams were characterized by optical and acoustical measurements. Amplitude and phase were measured in reflections from interfaces between water and aluminum, water and aluminum oxide, and water and stainless steel. The goniometer translated the receiver along a plane perpendicular to the direction of wave propagation, allowing point-by-point measurement across the width of the field. Field amplitude was measured as voltage developed across the receiver crystal; relative phase was measured by synchronizing the receiver ososcilloscope with the transmitted pulse and recording changes in the delay of the received pulse. Some major features in the measured-amplitude profiles resemble features that Bertoni and Tamir illustrate in their solutions.

AD-A016 087/9GA PC$3.25/MF$2.25
Henry Krumb School of Mines New York
Acoustic Emission Caused by Large Alternating Strains,
W. P. Mason, D. N. Beshers, M. C. Jon, and J. T. Kuo. 13 Sep 74, 5p ARO-10350.3-MC
Grant DA-ARO-D-31-124-72-G117
Availability: Pub. in Ultrasonics, p128-131 May 75.

Descriptors: *Acoustic emissions, *Crystal structure, *Copper, *Brass, Single crystals, Polycrystalline, Vibration, Strain(Mechanics), Harmonics, Crystal lattices, Reprints.

By vibrating specimens at very high strains, acoustic emission has been observed under controlled conditions. Continuous emission, in the form of strong harmonic generation, has been observed for polycrystalline copper and brass. In single crystal copper, a nonharmonic, burst type, response has also been observed. For brass the internal friction and the third harmonic were analysed in terms of dislocation models of Granato-Lucke and Peguin et al. A dynamic dislocation multiplication mechanism is suggested for the burst type emissions. (Author)

NTIS/PS-75/762/5GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Maneuvering Aircraft: Noise Pollution and Control (A Bibliography with Abstracts).
Rept. for 1964-Sep 75,
Guy E. Habercom, Jr. Oct 75, 175p*
Supersedes NTIS/PS-75/060.

Descriptors: *Bibliographies, *Aircraft noise, *Flight maneuvers, *Noise pollution, Aircraft, Aircraft landings, Takeoff, Noise reduction, Jet engine noise, Aircraft modification, Abstracts.

Methods for alleviating noise created by maneuvering aircraft are analyzed in these Government-sponsored research reports. (Contains 170 abstracts) For aircraft sonic boom see NTIS/PS-75/318, Studies on Flight and Design; NTIS/PS-75/319, Effects on Buildings; and NTIS/PS-75/320, Biological Effects.

N75-30176/2GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Interim Prediction Method for Externally Blown Flap Noise.
R. G. Dorsch, B. J. Clark, and M. Reshotko. 1975, 51p NASA-TM-X-71768, E-8423

Descriptors: *Externally blown flaps, *Noise spectra, *Prediction analysis techniques, Data correlation, Exhaust velocity, Sound pressure, Velocity distribution.

For abstract, see STAR 1321

N75-30179/6GA PC$8.50/MF$2.25
Neilsen Engineering and Research, Inc., Mountain View, Calif.
Further Studies of Methods for Reducing Community Noise around Airports.
R. H. Petersen, D. J. Barry, and D. M. Kline. May 75, 275p NASA-CR-137739, NEAR-TR-86

Contract NAS2-8190

Descriptors: *Aircraft engines, *Aircraft noise, *Airports, *Communities, *Noise reduction, Aerodynamic noise, Computerized simulation, Flight paths, Printouts, Tables (Data), Takeoff.

For abstract, see STAR 1321

N75-30201/8GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Considerations for the Project of an AERO-Acoustical Wind Tunnel.
G. Schulz. Aug 75, 20p NASA-TT-F-16508, DLR-MITT-74-27
Contract NASW-2791
Tran-Transl. Into English of "Ueberlegungen Zum Projekt Eines Aeroakustik-Windkanals", Rept. Dlr-Mitt-74-27, West Germany, 1974 p 1-18.

Descriptors: *Acoustic attenuation, *Aerodynamic noise, *Air ducts, *Noise reduction, *Subsonic wind tunnels, Acoustic measurements, Sound intensity.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30585/4GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Acceleration and Sound Attenuation in Steel Plates Bare and Covered with Special Damper.
L. X. Nepomuceno. 5 May 75, 12p REPT-7505.783
In Portuguese; English Summary

Descriptors: *Acoustic attenuation, *Metal plates, *Steels, *Vibration damping, Accelerometers, Noise measurement, Noise reduction.

For abstract, see STAR 1321

N75-30671/2GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Low Altitude Temperature and Humidity Profile Data for Application to Aircraft Noise Propagation.
A. B. Connor, W. L. Copeland, and D. C. Fulbright. Sep 75, 60p NASA-TN-D-7975, L-10117

Descriptors: *Aircraft noise, *Atmospheric temperature, *Humidity, *Sound transmission, Meteorological parameters, Statistical analysis, Tables (Data), Wave propagation.

For abstract, see STAR 1321

N75-30866/8GA PC$5.75/MF$2.25
Hamilton Standard, Windsor Locks, Conn.
Study of Noise Sources in a Subsonic Fan Using Measured Blade Pressures and Acoustic Theory.
Final Report.
D. B. Hanson. Aug 75, 138p NASA-CR-2574
Contract NAS1-12505

Descriptors: *Inlet pressure, *Noise spectra, *Propulsion, *Rotor blades (Turbomachinery), *Turbulence, Boundary layers, Statistical correlation, Tip speed.

For abstract, see STAR 1321

N75-30867/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Numerical Study of Sound Propagation in a Jet Flow.
S. L. Padula, and C. H. Liu. Sep 75, 21p NASA-TN-D-8012, L-10249

Descriptors: *Computer storage devices, *Computerized simulation, *Jet flow, *Sound propagation, Flow distribution, Mach number, Mathematical models, Noise reduction.

For abstract, see STAR 1321

N75-30868/4GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Noise Level Measurements and Octave Spectrum inside Working Place, Aiming the Detection of Noise Pollution.
L. X. Nepomuceno. 19 May 75, 8p REPT-7505.788
In Portuguese; English Summary.

Descriptors: *Noise measurement, *Octaves, Health, Noise pollution, Noise reduction.

For abstract, see STAR 1321

N75-30869/2GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Sound Level Measurement and Analysis in Industrial Installations and in Complaining Neighbors. Legal Situation.
L. X. Nepomuceno. 17 Apr 75, 21p TR-7504.780
In Portuguese; English Summary.

Descriptors: *Acoustic measurements, *Noise pollution, *Octaves, Brazil, Graphs (Charts), Law (Jurisprudence), Noise reduction.

For abstract, see STAR 1321

PB-245 409/8GA PC$6.25/MF$2.25
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
Passenger Noise Environments of Enclosed Transportation Systems.
Jun 75, 155p EPA/550/9-75/025

Descriptors: *Transportation noise, *Exposure, *Stress(Psychology), Health, Threat evaluation, Enclosures, Acoustic measurement, Trends, Intensity, Automobiles, Buses(Vehicles), Railroad cars, Aircraft noise.
Identifiers: *Noise pollution, Noise exposure, Subways.

To determine the extent to which noise environments of enclosed transportation systems are deleterious to passenger health, an analysis was made of both information collected by past transportation studies and of new data collected for this project. The analysis consisted of identifying trends among various transportation modes, noting areas of data deficiency, calculating the effect of noise exposure on health under various assumptions of travel duration and workplace noise exposure levels, and assessing measurement methodologies.

20B. Crystallography

AD-A015 731/3GA PC$3.75/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
Determination of Texture Pole Figures Using Picker FACS-1 Apparatus.
Technical rept. Apr-Dec 74,
L. A. Jacobson, and Robert Schafrik. Jun 75, 48p Rept no. ARL-75-0190

Descriptors: *Crystallography, *Goniometers, *Polarography, *Diffraction analysis, *Computer programs, X ray diffraction, Coordinates, Minicomputers, Directional, Detectors, Plotting, Crystal structure.
Identifiers: Stereographic projection, Rectangular coordinates, Picker FACS-1 apparatus.

The Picker FACS-1 Apparatus consists of a three axis goniometer, with associated x-ray generating and detecting equipment, controlled by a dedicated PDP-8 minicomputer. By means of a control program developed at Vanderbilt University, it is possible to generate values of integrated x-ray diffraction peak intensity over preselected goniometer rotation angles. A specimen of the type proposed by Lopata and Kula, consisting of a plane cut at equal angles to the principal material axes (54 deg 44 ft), can be conveniently rotated to obtain data for an entire quadrant of the stereographic projection. Equations are presented for converting goniometer angles to latitude and longitude, and for converting latitude and longitude to rectangular coordinates for automatic plotting. A description of the plotting routine is presented along with examples of several texture plots. (Author)

AD-A015 775/0GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Remarks on the Green's Functions for the Cubic Lattices,
Koichi Mano. 21 Apr 75, 4p Rept no. AFCRL-TR-75-0520
Availability: Pub. in Jnl. of Mathematical Physics, v16 n9 p1726-1728 Sep 75.

Descriptors: *Crystal lattices, *Green's function, Reprints.
Identifiers: Body centered cubic lattices, Face centered cubic lattices, Cubic crystals.

A simpler way of finding the Green's function G(2p, 0, 0) for the body-centered and face-centered cubic lattices as the square and product, respectively, of the pth derivatives of two complete elliptic integrals of the first kind is pointed out. The key relations required for these results are the Clausen's and Brafman's formulas for the body-centered and face-centered cubic lattices, respectively. (Author)

AD-A016 071/3GA PC$3.25/MF$2.25
Louisiana State Univ Baton Rouge Dept of Physics and Astronomy
Dielectric Matrix for Aluminum,
S. P. Singhal. 3 Feb 75, 12p ARO-12287.2-P
Grant DAHC04-74-G-0173
Availability: Pub. in Physical Review B, v11 n2 p564-574, 15 Jul 75.

Descriptors: *Aluminum, Dielectrics, Electrons, Transport properties, Wave functions, Density, Voltage, Fourier transformation, Matrix theory, Reprints.

The dielectric screening matrix for aluminum is evaluated using realistic band energies and wave functions. The Bloch states are obtained from a self-consistent tight-binding calculation in which Gaussian orbitals are used as basis functions.

AD-A016 209/9GA PC$3.25/MF$2.25
Brown Univ Providence R I
Crystal Growth and Characterization of Platinum Ditelluride,
S. Soled, A. Wold, and O. Gorochov. 2 Jun 75, 7p ARO-6079.30-MC
Grant DA-ARO-D-31-124-73-G13
Availability: Pub. in Materials Research Bull., v10 n8 p831-835 1975.

Descriptors: *PLatinum compounds, *Tellurides, *Crystal growth, *Single crystals, Phosphorus, Sulfur, Chemical reactions, Vapor deposition, Magnetic properties, Reprints.

Crystals of platinum ditelluride were grown by chemical vapor transport from a charge zone

maintained at 875 C. and a growth zone at 690 C. Combinations of platinum, phosphorus, sulfur, and tellurium in the molar ratios of 1:1:3:2 were used as the reactants. The crystals obtained contained 0.4% sulfur by weight and were also several percent deficient in platinum. The phase was diamagnetic with a susceptibility of -12(1) emu/mole between 77 K. and 300 K. and single crystals exhibited metallic behavior between 4.2 K. and 300 K. (Author)

AD-A016 212/3GA PC$3.25/MF$2.25
Rochester Univ N Y Dept of Mechanical and Aerospace Sciences
Energy of Grain Boundaries Between Cusp Misorientations,
K. K. Shih, and J. C. M. Li. 23 Oct 74, 17p ARO-10608:3-MC
Grant DA-ARO-D-31-124-73-G77
Availability: Pub. in Surface Science, 50 P109-124 1975.

Descriptors: *Grain boundaries, *Copper, *Aluminum, *Energy, Orientation(Direction), Mathematical models, Reprints.
Identifiers: Burgers vectors.

The disclination of high angle grain boundaries proposed before is used to understand the energy-angle relations between cusp misorientations. It is found that the model predicts the correct relationship within experimental error with only one adjustable parameter which resembles the Burgers vector of dislocations at low angles. Experimental data for (100) symmetric tilt boundaries in Cu and Al and for (110) symmetric tilt boundaries in Al are used for illustration. (Author)

COM-75-50568/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Crystal Structure of NH4ClO4 at 298, 78, and 10K by Neutron Diffraction.
Final rept.,
C. S. Choi, H. J. Prask, and E. Prince. 1 Nov 74, 7p
Pub. in Jnl. of Chemical Physics, v61 n9 p3523-3529, 1 Nov 74.

Descriptors: *Crystal structure, *Ammonium perchlorate, Neutron diffraction, Cryogenics.
Identifiers: Reprints.

The NH4ClO4 crystal has an orthorhombic unit cell, space group Pnma, with four formula units per cell at all three temperatures. Initial positions of H atoms were determined from a difference Fourier map of the room temperature data. Each ammonium group is surrounded by 10 oxygen atoms with short N...0 distances ranging from 2.9 to 3.25 A. The Clo-4 group and NH+4 group each have essentially ideal tetrahedral structure. They are linked together by N-H...0 type hydrogen bonds, one for each hydrogen, to form a three-dimensional network. Examinations of the rms amplitudes for libration and the hydrogen bonding of the NH+4 ions indicates that two of the four hydrogens are bound identically. One hydrogen is bound more rigidly, and the fourth more weakly. These results suggest that the rotational motions of the ammoniums are quite complex even at 10K.

KAPL-M-7412 PC$5.50/MF$2.25
Knolls Atomic Power Lab., Schenectady, N.Y.
Excess Entropy for a Vacancy in a Crystal.
D. M. Brudnoy. Apr 75, 46p

Descriptors: (*Crystals, Vacancies), (*Metals, Vacancies), (*Vacancies, *Entropy), Perturbation theory, Vibrational states.

For abstract, see NSA 32 08, number 20258.

N75-30898/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
The Growth of Deactivated Layers on CsI(Na) Scintillating Crystals.
N. B. Goodman. Aug 75, 23p NASA-TM-X-70956, X-682-75-201
Subm-Submitted for Publication. Misc-Original Contains Color Illustrations.

Descriptors: *Cesium iodides, *Crystal growth, *Scintillation counters, *Sodium compounds, Alpha particles, Radiation damage, Radiation effects, X ray sources.

For abstract, see STAR 1321

20C. Electricity and Magnetism

AD-A015 944/2GA PC$3.75/MF$2.25
Naval Research Lab Washington D C
Metallurgical Processing and Superconducting Parameters of the V3Ga A15 Phase.
Final rept.,
B. N. Das, R. W. Huber, and J. E. Cox. 10 Sep 75, 46p Rept no. NRL-7907

Descriptors: *Superconductors, *Superconductivity, *Vanadium alloys, *Gallium alloys, Crystal lattices, Parameters, Microstructure, Phase transformations, Hardness, Phase studies, Transition temperature, Arc melting, Casting, Heat treatment, X ray diffraction.

The solid-state bcc-to-A15 phase information in V3Ga, the extension of this A15 phase field on both sides of the stoichiometric composition, and the high-field current-carrying capacity of V3Ga composite wires make V3Ga attractive for investigating how structure determines superconducting properties. However the extended freezing range in the V-Ga binary system promotes both dendritic segregation and a large-scale radial Ga gradient. For systematic study of the interrelations among the metallurgical processing procedures, the resultant microstructures, and the superconducting properties of the V3Ga A15 phase, eleven alloys, spanning the composition range of the A15 phase field and the adjacent two-phase fields, were arc-melting and cast as 1.3 cm-diameter rods. The dendritic segregation in the cast materials was made visible in metallographic sections by etching. A brief heat treatment at temperatures in the bcc-phase field eliminates the dendritic segregation and reduces the radial Ga gradient. By rapidly cooling the specimen through the bcc-to-A15 transformation, segregation from the transformation is on a fine scale and can be removed by a subsequent anneal within the beta-phase field. The transformed microstructures and the annealed microstructures of all materials of the V3Ga A15 phase were similar, and even microhardness was nearly constant over the full broad composition range of the V3Ga phase. The lattice parameter of the A15 V3Ga phase, measured by powder x-ray diffraction, increased with increasing Ga content. The present measurements define two lines intersecting near the V3Ga composition.

20D. Fluid Mechanics

AD-A015 621/6GA PC$3.75/MF$2.25
Columbia Research Corp Gaithersburg Md
Design, Development and Fabrication of a FOA Energy Separator for Use in Aircraft on-Board Oxygen Generating Systems.
Final rept.
28 Feb 75, 38p Rept no. CRC-122-8
Contract N62269-73-C-0686

Descriptors: *Jet aircraft, *Oxygen generators, Fluid flow, Flow separation, Thermodynamics, Cooling, Heating, Fluid mechanics.
Identifiers: Foa energy separators.

Contained herein is the development of a FOA Energy Separator (FES), a Cryptosteady device which separates an air flow into hot and cold fractions. The device is thermodynamically similar to the principle of a back-to-back expander-compressor, which in actuality does not exist. Therefore, the FES stands alone as a device to provide cooling without the need for heat exchange with the surroundings. This report describes its development specifically for application to the on-board generation of oxygen for future high performance Navy aircraft.

AD-A015 646/3GA PC$4.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
Design Criteria for Hydrofoil Hull Bottom Plating (A Practical Application of Research on Slamming),
Sheng-Lun Chuang. Aug 75, 94p Rept no. NSRDC-3509-Rev

Descriptors: *Slamming, *Hydrofoil craft, *Pressure distribution, Computations, Methodology, Hulls(Marine), Dynamic response, High velocity, Water waves, Plating, Theory, Utilization, Structural members.
Identifiers: Design criteria.

This report introduces a method for calculating pressure distributions on the hull bottom of a craft that is subjected to slamming loads at high cruising speed in waves. Design procedure and criteria for hydrofoil hull bottom plating and structure are included and examples given of their utilization in applications of the method. Various existing theories and methods on slamming are included in summary form for purposes of review and comparison.

AD-A015 659/6GA PC$3.25/MF$2.25
Royal Aircraft Establishment Farnborough (England)
The Drag of Ridges of Finite Length in a Turbulent Boundary Layer (Soprotivlenie Otdel'nykh Nerovnostei Poverkhnosti v Turbulentnom Pogranichnom Sloe),
V. M. Kovalenko, and N. I. Nesterovich. Jul 75, 15p Rept no. RAE-Library Trans-1852 DRIC-BR-48897
Trans. of Izvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR, Seriya Tekhnicheskikh Nauk (USSR) v13 n3 p107-114 1973 by G. H. Kinner.

Descriptors: *Aerodynamic drag, *Turbulent boundary layer, Ridges, Rectangular bodies, Curved profiles, Cross sections, Interference, Subsonic flow, Supersonic flow, Wind tunnel models, Surface roughness, Welds, Edges, Joints, Surface finishing, Aircraft protuberances, USSR, Translations, Great Britain.
Identifiers: Excrescences.

The drag due to ridges of rectangular and rounded sections and finite length have been measured at Mach numbers of 0.73 and 2.52 using a skin-friction type balance mounted in the sidewall of a wind tunnel. Results are given for a single ridge and one mounted behind the other. The interference between two rectangular ridges is unfavourable at M = 0.73 but favourable at M = 2.52. For rounded ridges the drag is appreciably less and little interference is apparent for both Mach numbers. The drag of swept single ridges is shown to be proportional to cos squard alpha and cos cubed alpha for the rectangular and rounded sections respectively. (Author)

AD-A015 692/7GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Effective Centered Expansions in Shock Tube Flows for Condensation Studies,
C. F. Lee. Jun 75, 24p
Contract N00014-67-A-0097-0012

Descriptors: *Shock tubes, *Nucleation, *Condensation, Gas flow, Expansion, Rayleigh scattering, Light scattering, Drops, Gas dynamics.
Identifiers: *Gas expansion, *Expansion flow.

Experimental investigations of the shock tube expansion flow have been carried out in the driver section by measuring the wall static pressure-time histories at three different observation stations. It is found that the effects of nonidealities in the actual flow manifest themselves predominatly close to the origin of the expansion process. A shift in the origin of the expansion process with respect to the diaphragm location is thus produced. The 'virtual origin' of the expansion can be determined by wall static pressure measurement at a single observation station and the effects of the nonidealities in real flow can be corrected once this virtual origin is found experimentally. A much improved shock tube method of studying condensation now exists in whcih the flow properties in the expansion fan are completely determined by static pressure measurements at two different observation stations with the onset of condensation determined by light scattering as before.

AD-A015 695/0GA PC$4.25/MF$2.25
Pennsylvania State Univ University Park Applied Research Lab
A Validation Study of the Mixed Foil Concept for High Speed Hydrofoils.
Technical memo.,
D. P. Wang, and Y. T. Shen. 18 Jun 75, 51p Rept no. TM-75-171
Contract N00017-73-C-1418

Descriptors: *Hydrodynamics, *Hydrofoils, Validation, High velocity, Flaps(Control surfaces), Lift to drag ratio, Planform, Mathematical models, Marine engineering, Flow fields, Activation.
Identifiers: Supercavitating foils, Design criteria.

A hydrodynamic validation study of the concept of the mixed foil has been carried out. A mixed foil is a streamlined hydrofoil equipped with a flap or other device which, above a certain speed, can be activated so as to change the flow around the foil into a supercavitating flow. At takeoff and at moderate speeds, a mixed foil is operated as a subcavitating foil; at high speeds, it is operated as a supercavitating foil. During high speed operations, a reduction in the wetted planform area of a mixed foil is proposed. Two hydrofoils which have as their sections plano-convex foils of thickness to chord ratios of 5% and 6% are used for the study.

AD-A015 707/3GA PC$6.25/MF$2.25
Airesearch Mfg Co of Arizona Phoenix
Separated Flow Program for Office of Naval Research.
Annual rept. 15 Jun 74-15 Jun 75,
P. R. Dodge. 15 Jun 75, 152p Rept no. 74-211196-4
Contract N00014-74-C-0317

Descriptors: *Flow separation, *Navier Stokes equations, Flow fields, Partial differential equations, Numerical integration, Computations, Computer applications.
Identifiers: CDC 7600 computers, CDC 6400 computers.

This document describes the results of the past year of a study for evaluating a numerical method for solution of the ensemble-averaged Navier-Stokes Equations.

AD-A015 712/3GA PC$3.25/MF$2.25
Science Applications Inc Ann Arbor Mich
Low Speed Separation.
Final rept.,
Patrick J. Roache. 15 Sep 75, 21p Rept no. SAI-75-510-AQ
Contract N00014-75-C-0068

Descriptors: *Flow separation, *Low velocity, Boundary layer flow, Problem solving, Finite difference theory, Fourier transformation, Reynolds number, Equations of motion, Stalling, Wake, Fluidic control, Oscillation, Mathematical models.
Identifiers: High Reynolds number flow.

Two approaches are considered for the high Reynolds number separated flow computational problem: these are high-order finite difference methods and Fourier Transform methods. A technique called 'reduction to periodicity; which allows the use of the FFT on non-periodic problems is tested and verified. This technique is shown to be a worthwile contribution to computational fluid dynamics, and does address one aspect of the high Reynolds number problem, but it does not by itself allow the accurate solution of high Reynolds number separated flows.

AD-A015 725/5GA PC$3.75/MF$2.25
Iowa State Univ Ames Engineering Research Inst
Duct Flow Analysis Methods for V/STOL Propulsion System Application.
Final rept.,
George K. Serovy, and Patrick Kavanagh. Apr 75, 35p Rept nos. ISU-ERI-AMES-75085, TCRL-4
Contract N00019-74-C-0401

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Ducts, *Fluid flow, Fluid dynamics, Turbulent flow, Compressible flow, Numerical analysis.
Identifiers: *Duct flow.

This investigation was concerned with aerodynamic analysis methods for non-rotating elements of the flow path in lift/thrust-vectoring/propulsion systems for V/STOL aircraft. The character of the flows which occur in these systems in current and projected V/STOL aircraft was examined, and a broad spectrum of design methods was considered. These ranged from simple, one-dimensional calculations with high empirical content to recently developed internal turbulent flow field computational models. Special emphasis was placed on evaluation of the status of the more advanced computational methods, so that realistic objectives might be established for planning future programs. The most difficult of the presently unresolved problems in adaptation of internal flow computation models to general flow passage analysis appear to lie in the development of turbulence models and in the complex nature of real duct geometry.

AD-A015 743/8GA PC$3.75/MF$2.25
Arnold Engineering Development Center Arnold Air Force Station Tenn
Pressure and Heat Transfer Tests on the NASA Space Shuttle External Tank at Mach Number 16.
Final rept. 9 Aug-20 Sep 74,
L. G. Siler, and A. H. Boudreau. Oct 75, 49p Rept no. AEDC-TR-75-31
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn., Rept. no. ARO-VKF-TR-74-129.

Descriptors: *Aerodynamic heating, *Fuel tanks, *Space shuttles, Wind tunnel tests, Hypersonic flow, Pressure distribution, Heat transfer, Simulation, Tumbling, Angle of attack, Staging, Separation, Roll, Free stream, Mach number, Interference, Reynolds number, Test methods.

An experimental test program was conducted in the AEDC-VKF Hypervelocity Wind Tunnel (F) at a nominal Mach number of 16 to obtain basic heating and pressure distribution data on the NASA Space Shuttle external tank. The tests were conducted over an attitude range which simulated tank tumbling after separation from the Shuttle orbiter. The angles of attack varied from 0 to -180 deg with combinations of roll from 0 to 90 deg at free-stream Reynolds numbers (based on model length) from 0.38 x 1,000,000 to 1.10 x 1,000,000. In addition to surface heat-transfer gages, thermographic phosphor paint was used to determine the interference heating factors on and around the various attachment structures and service ducts.

AD-A015 874/1GA PC$3.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Comparison of Computer Predicted and Experimentally Determined Leading Edge Cavitation of a Foil with Flaps.
Final rept.,
Richard M. Norton, and Benjamin B. Wisler.
Aug 75, 28p Rept no. SPD-326-06

Descriptors: *Cavitation, *Hydrofoils, *Leading edges, *Flaps(Control surfaces), Model tests, Two dimensional, Three dimensional, Lift, Angles, Drag, Tables(Data), Hydrofoil craft, Computer programs, Mathematical prediction, Experimental data, Accuracy, Comparison.
Identifiers: PCH 1 vessel.

A model test and computer study were compared to assess the ability of a computer program to predict leading-edge cavitation inception. A 1/8 scale model of the PCH-1 forward foil was tested in the high speed towing tank at the David W. Taylor Naval Ship Research and Development Center and assessed by a two-dimensional computer program. Included is the method developed to take into account small flap angles. The results indicate that the two-dimensional program is able to make satisfactory predictions of leading edge cavitation for the PCH-1 foil when invested with three-dimensional values of the lift coefficient and the lift curve slope. (Author)

AD-A015 912/9GA PC$3.75/MF$2.25
Texas Engineering Experiment Station College Station
Aerodynamic Coefficients for a Staggered Cascade of Oscillating Airfoils in Subsonic Flow,
W. P. Jones, and Jimmie A. Moore. May 75, 37p Rept no. TEES-3068-75-02 AFOSR-TR-75-1216
Grant AF-AFOSR-2700-74

Descriptors: *Cascades(Fluid dynamics), *Aerodynamic characteristics, Airfoils, Oscillation, Coefficients, Compressible flow, Subsonic characteristics, Damping, Nonuniform flow, Phase.

A method developed and described in an earlier paper is used to determine the aerodynamic coefficients for a cascade of staggered airfoils in compressible subsonic flow. In that report, the case of the unstaggered cascade was considered and in the present report the authors extend their earlier work to include a study of the effects of stagger angle on the aerodynamic coefficients. Particular attention is devoted to changes in the direct aerodynamic damping coefficients for plunging and pitching oscillations in high Mach number flow for particular values of the phase difference between the motions of adjacent staggered airfoils.

AD-A015 913/7GA PC$4.25/MF$2.25
Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)
Effect of Shock Impingement on Heat Transfer. Part III. An Investigation of

Adiabatic Laminar Boundary Layer/Shock Wave Interactions on Curved Walls.
Interim scientific rept. no. 4, 1 Jan-31 Dec 74,
Jean J. Ginoux, and David S. Dolling. Jan 75, 62p Rept no. VKI-TN-105 AFOSR-TR-75-1239
Grant AF-AFOSR-2147-71
See also report dated Feb 74, AD-778 962.

Descriptors: *Laminar boundary layer, *Shock waves, *Heat transfer, Interactions, Impingement, Pressure distribution, Static pressure, Supersonic characteristics, Curved profiles, Walls, Mathematical models, Flow fields, Flat plate models, Mathematical prediction, Comparison, Experimental data, Ramps, Belgium.
Identifiers: Curved walls, Shock impingement, Shock wave interactions.

Static pressure distributions in supersonic flow have been measured on the surface of a flat plate/curved ramp model and on a flat plate curved afterbody model with equivalent impinging shock. Under adiabatic supersonic flow conditions, an equivalence between the two configurations is shown to exist. Using this concept of equivalence the Lees-Reeves-Klineberg integral method has been successfully modified to include surface curvature and the predicted static pressure distributions compared directly with the experimental curved ramp data.

AD-A015 915/2GA PC$4.25/MF$2.25
Polytechnic Inst of New York Farmingdale Dept of Aerospace Engineering and Applied Mechanics
The Viscous Layer in the Symmetry Plane of a Sharp Cone at Incidence.
Interim rept.,
S. G. Rubin, T. C. Lin, and F. Tarulli. Jun 75, 53p Rept no. POLY-AE/AM-75-8 AFOSR-TR-75-1352
Grant AF-AFOSR-2635-74

Descriptors: *Conical bodies, *Supersonic characteristics, *Boundary layer flow, Angle of attack, Laminar flow, Turbulent flow, Boundary layer transition, Equations of motion, Numerical methods and procedures, Symmetry, Flow fields, Comparison, Graphics, Velocity, Heat transfer, Cross flow.
Identifiers: *Windward side characteristics, *Lee side characteristics, Similarity, Velocity profiles.

Numerical solutions for the wind and lee symmetry planes on sharp cones at incidence are obtained for both laminar and turbulent boundary layers. Comparisons are made between solutions obtained with the similarity boundary layer equations, the non-similar boundary layer equations and the non-similar boundary region equations. For large incidence, after crossflow reversal has occurred, non-similar boundary layer solutions are obtained at the leeplane but are in poor agreement with experimental data. For turbulent flows, non-similar boundary layer solutions are obtained in all cases.

AD-A015 938/4GA PC$3.75/MF$2.25
Dcw Industries Sherman Oaks Calif
Effects of Surface Heat Transfer on Boundary-Layer Transition.
Interim rept. 1 Apr-30 Jul 75,
David C. Wilcox, and Thomas L. Chambers. Jul 75, 35p Rept no. DCW-R-03-03 AFOSR-TR-75-1398
Contract F44620-74-C-0048, ARPA Order-2980

Descriptors: *Boundary layer transition, *Heat transfer, Mathematical prediction, Experimental data, Aerodynamic characteristics, Blunt bodies, Surface properties, Heating, Stability, Mathematical models, Hydrodynamic configurations, Effectiveness.
Identifiers: Surface heating.

Effects of surface heat transfer on boundary-layer transition are analyzed in a three-part study using the Saffman-Wilcox transition model. In the first part model predictions are compared with experimental data for cooled and heated aerodynamic boundary layers on smooth flat surfaces and for cooled aerodynamic boundary layers near the stagnation point of a roughened blunt body. Next, incipient transition conditions are determined for a small, heated hydrodynamic body. In the final part of the study, transition location is determined for a large hydrodynamic body; results indicate that large surface heating rates are not substantially more effective than smaller rates.

AD-A015 96_/4GA PC$3.75/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Hydrodynamic Characteristics of a Control Surface.
Final rept.,
Charles G. Moody. Sep 75, 29p Rept no. SPD-640-01

Descriptors: *Hydrodynamics, *Control surfaces, *Marine rudders, Cavitation, Stalling, Angle of attack.

A study of the performance of a low-aspect-ratio, all-movable control surface in water is presented and compared with the performance of similar control surfaces in air. The results of this study show the free-stream characteristics of a control surface with an NACA 0015 section and a 45 percent taper ratio for different conditions affecting cavitation and stall. It is concluded that large angles of attack should be avoided under conditions that may cause stall. (Author)

AD-A016 016/8GA PC$3.25/MF$2.25
Iowa State Univ Ames Engineering Research Inst
Duct Flow Analysis Methods for V/STOL Propulsion System Applications.
Interim rept. 1 Apr-30 Jun 74,
George K. Serovvy, and Patrick Kavanagh. Aug 74, 23p Rept nos. ISU-ERI-AMES-74167, TCRL-2
Contract N00019-74-C-0401
See also report dated Apr 75, AD-A015 725.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Ducts, *Fluid flow, Fluid dynamics, Turbulent flow, Compressible flow, Numerical analysis.
Identifiers: *Duct flow.

Preliminary studies of design analysis requirements and potentially useful analysis methods for V/STOL propulsion system flow transfer components are described. A broad spectrum of design method might be considered, ranging from simple one-dimensional calculations with strong empirical content to the most sophisticated fluid computational models and numerical procedures. Subsequent interim reports will review a number of alternative design systems, emphasizing their strong features and limitations in dealing with a strongly three-dimensional, turbulent and compressible flow.

AD-A016 017/6GA PC$3.25/MF$2.25
Iowa State Univ Ames Engineering Research Inst
Duct Flow Analysis Methods for V/STOL Propulsion System Applications.
Interim rept. 1 Jul-30 Sep 74,
George K. Serovy, and Patrick Kavanagh. Dec 74, 24p Rept nos. ISU-ERI-AMES-74253, TCRL-3
Contract N00019-74-C-0401
See also report dated Aug 74, AD-A016 016.

Descriptors: *Vertical takeoff aircraft, *Short takeoff aircraft, *Ducts, *Fluid flow, Fluid dynamics, Turbulent flow, Compressible flow, Numerical analysis.
Identifiers: *Duct flow.

In this interim report a selected bibliography of recent journal articles concerned with V/STOL lift/thrust vectoring/propulsion systems and with potentially attractive internal flow field computation systems is presented and discussed. Many of the flow configurations associated with V/STOL propulsion are so complex, involving asymmetric cross-sections, severe bends, offset sections, diverters, bleeds, etc., that an investigation of the real role of computational fluid dynamics in design and analysis is indicated. A specific goal should be to gain a clear understanding of the current and potential capabilities of candidate flow passage computational methods so that illusions can be destroyed and emphasis can be placed on the methods which can make a contribution now or at a predictable future time.

AD-A016 085/3GA PC$3.25/MF$2.25
Cornell Univ Ithaca N Y Dept of Theoretical and Applied Mechanics
Higher-Order Approximation for Free Shear Layers in Almost Rigid Rotations,
L. Pamela Cook, and G. S. S. Ludford. 24 Aug 73, 6p ARO-5329.71-M
Grants DA-ARO-D-31-124-71-G163, NSF-GP-28483
Availability: Pub. in Jnl. of Fluid Mechanics, v69 pt1 p191-195 1975.

Descriptors: *Fluid mechanics, *Approximation(Mathematics), *Disks, Flow fields, Shear stresses, Velocity, Transformations(Mathematics), Rotation, Discontinuities, Reprints.
Identifiers: *Hankel functions.

The free shear layer stemming from a discontinuity in angular velocity at either of two parallel disks in almost rigid rotation with fluid between is re-examined. The sole discrepancy between theory and experiment is unaffected by higher-order approximation unless curvature effects are included, when it is reduced. (Author)

AD-A016 096/0GA PC$5.25/MF$2.25
Stanford Univ Calif Thermosciences Div
The Behavior of Transpired Turbulent Boundary Layers,
Robert J. Moffat, and William M. Kays. Apr 75, 115p Rept no. HMT-20
Contract N00014-67-A-0112-007, Grant NSF-GK-534
See also report dated May 75, AD-A014 219. Errata sheet inserted.

Descriptors: *Turbulent boundary layer, *Heat transfer, Data bases, Data acquisition, Mathematical models, Finite difference theory, Computer applications, Mixing, Prandtl number, Velocity, Transpiration, Walls, Temperature, Skin friction, Mathematical prediction, Boundary layer control, Experimental data.
Identifiers: Mixing length, Velocity profiles.

This report summarizes almost seven years of experimental and analytical studies of the heat transfer behavior of the turbulent boundary layer. The principal objective has been the acquisition of a reliable data base and its modeling by means of a finite-difference computer program. Experimental results are provided to the computer in terms of values and variations of mixing length parameters and turbulent Prandtl numbers. The data base covers a wide range of boundary conditions and free stream conditions for free stream velocities; transpiration; and wall temperature.

AD-A016 113/3GA PC$4.75/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
A Solution for Laminar Flow Past a Rotating Cylinder in Crossflow.
Final rept.,
Kevin S. Fansler, and James E. Danberg. Aug 75, 87p Rept no. BRL-1816

Descriptors: *Laminar flow, Laminar boundary layer, Vortices, Inviscid flow, Computations, Computer programs, Two dimensional flow, FORTRAN, Numerical integration, Cylindrical bodies.
Identifiers: FORTRAN 4 programming language.

Two-dimensional subcritical flow past a rotating cylinder has been theoretically treated to obtain agreement with the boundary-layer calculations. This study combined a source-wake bound-vortex flow model with a moving-wall boundary-layer calculation to force the final inviscid-flow model to be consistent with boundary-layer theory. Consistency was obtained by an iterative process whereby the separation points of the inviscid-flow model converged toward the separation points found by boundary-layer calculations. The boundary-layer is calculated using the integral-momentum and the integral-energy equations where the family of moving-wall similarity boundary-layer solutions provide relationships between some parameters of the equations.

AD-A016 192/7GA PC$3.75/MF$2.25
Naval Research Lab Washington D C
Shock Wave Propagation in an Inhomogeneous Medium Using Finite Differences.
Interim rept.,
D. G. Colombant, and H. H. Gardner. Sep 75, 27p Rept no. NRL-MR-3116

Descriptors: *Hydrodynamics, *Finite difference theory, Shock waves, Partial differential equations, Algorithms.

One-dimensional propagation of a strong shock wave in a medium with an exponentially varying density is studied numerically. Solutions using various formulations of the energy equation are compared with the self-similar analytic solution. It was found that only the conservative energy equation predicts the correct shock propagation; the temperature and pressure formulations, even with artificial viscosity are far less satisfactory. This result holds over a wide range of different spatial resolutions and for different finite-difference algorithms.

AD-A016 216/4GA PC$4.75/MF$2.25
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Structure of Turbulence in Boundary Layers,
William W. Willmarth. 1975, 97p Rept no. 021490
Contract N00014-67-A-0181-0015
Availability: Pub. in Advances in Applied Mechanics, v15 p159-254 1975.

Descriptors: *Turbulent boundary layer, *Vortices, *Turbulence, Intensity, Structural properties, Motion, Viscosity, Reprints.

The monograph surveys the present (1973-1974) status of experimental research on turbulent structure in boundary layers. The primary importance of the vorticity is stressed and both the general structural features and the nature of coherent organized motions in boundary layers are discussed. The rapid advances in research now being made will surely continue so that the present survey provides only a glimpse of future results and understanding. (Author)

N75-30093/9GA PC$7.50
Engineering Sciences Data Unit, London (England).
Drag of Streamline Solids of Revolution (Transition at 0.1 Body Length Behind Nose).
Jul 73, 3p ESDU-BODIES-02.04.02
Misc-Amendment a.

Descriptors: *Bodies of revolution, *Drag measurement, *Streamlined bodies, *Transition flow, Graphs (Charts), Laminar flow, Turbulent flow.

For abstract, see STAR 1321

N75-30110/1GA PC$3.75/MF$2.25
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
Linearised Supersonic Flows with Boundary Conditions Specified on Two Concentric Cylinders.
H. Portnoy. Jan 75, 31p TAE-239

Descriptors: *Concentric cylinders, *Linear systems, *Operational calculus, *Supersonic flow, Jet flow, Numerical analysis, Pressure distribution.

For abstract, see STAR 1321

N75-30464/2GA PC$6.25
Societe Bertin et Cie, Plaisir (France).
Computation Program for Three-Dimensional Incompressible Flow Realisation d'UN Programme de Calcul d'Ecoulements Tridimensionnels de Fluides Incompressibles.
Final Report.
R. Virefleau. 12 Jun 74, 155p REPT-74-CB-06
Contract DGRST-72-7-0724
Language in French.

Descriptors: *Computer programs, *Incompressible flow, *Mathematical models, *Three dimensional flow, Computerized simulation, Discrete functions, Finite difference theory, Graphs (Charts), Subsonic flow, Turbulent flow.

For abstract, see STAR 1321

N75-30465/9GA PC$3.75/MF$2.25
Stanford Univ., Calif. Thermosciences Div.
Computation of Turbulent Flows.
W. C. Reynolds. May 75, 43p NASA-CR-143323, SU-TF-4
Contract NGR-05-020-622

Descriptors: *Incompressible flow, *Partial differential equations, *Prediction analysis techniques, *Turbulent flow, Boundary layers, Hydrodynamics, Velocity distribution.

For abstract, see STAR 1321

N75-30467/5GA PC$3.25/MF$2.25
University of Southern Calif., Los Angeles. Dept. of Aerospace Engineering.
On Upstream Blocking in a Viscous Diffusive Stratified Flow.
C. G. Koop, and L. G. Redekopp. 1975, 18p NASA-CR-143338
Contract NGR-05-018-178

Descriptors: *Diffusion, *Flat plates, *Stratified flow, *Velocity distribution, Asymptotic methods, Density distribution, Numerical integration.

For abstract, see STAR 1321

N75-30470/9GA PC$7.00/MF$2.25
Virginia Polytechnic Inst. and State Univ., Blacksburg. Aerospace and Ocean Engineering Dept.
Computer User'S Guide for a Chemically Reacting Viscous Shock-Layer Program.
E. W. Miner, and C. H. Lewis. May 75, 186p NASA-CR-2551
Contract NAS9-12630

Descriptors: *Blunt bodies, *Chemical reactions, *Laminar flow, *Shock layers, *User manuals (Computer programs), Heat transfer, Reentry vehicles, Reynolds number.

For abstract, see STAR 1321

N75-30476/6GA PC$5.75/MF$2.25
Stanford Univ., Calif. Dept. of Mechanical Engineering.
Numerical Simulation of Turbulence in the Presence of Shear.
S. Shaanan, J. H. Ferziger, and W. C. Reynolds. Aug 75, 140p NASA-CR-143349, SU-TF-6
Contract NGR-05-020-622

Descriptors: *Numerical analysis, *Shear flow, *Turbulent flow, Computerized simulation, Navier-stokes equation.

For abstract, see STAR 1321

N75-30477/4GA PC$5.75/MF$2.25
Stanford Univ., Calif. Thermosciences Div.
Three-Dimensional Time Dependent Computation of Turbulent Flow.
D. Kwak, W. C. Reynolds, and J. H. Ferziger. May 75, 134p NASA-CR-143347, SU-TF-5
Contract NGR-05-020-622

Descriptors: *Equations of motion, *Three dimensional flow, *Time dependence, *Turbulent flow, Finite difference theory, Numerical analysis, Residual stress.

For abstract, see STAR 1321

N75-30478/2GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Experimental Investigation of the Coefficient of Friction in the Turbulent Flow of an Incompressible Fluid in the Presence of an Undulated Wall.
C. Cancelli, and F. Vatta. Aug 75, 25p NASA-TT-F-16525, NO-20
Contract NASW-2790
Tran-Transl. Into English of "Indagine Sperimentale Sul Coefficiente di Attrito di Una Corrente Turbolenta di UN Fluido Incompressible in Presenza -di Ondulosita di Parete", Rept. Memorie No. 20 Accademia Della Scienze, Classe di Scienze Fisiche, Matematichee Naturali, Italy, 1974 p 1-20.

Descriptors: *Coefficient of friction, *Fluid flow, *Incompressible flow, *Turbulent flow, Boundary layer separation, Channel flow, Separated flow, Wall pressure.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30481/6GA PC$4.75/MF$2.25
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Aerospace and Ocean Engineering.
Supersonic Turbulent Boundary-Layer Flows with Mass Injection Through Slots and/or Porous Walls.
Final Report.
A. L. Murray, and C. H. Lewis. Sep 75, 84p NASA-CR-2587
Contract NGR-47-004-106

Descriptors: *Boundary layer flow, *Mass transfer, *Supersonic boundary layers, *Turbulent boundary layer, Eddy viscosity, Finite difference theory, Numerical analysis, Porous plates, Skin friction.

For abstract, see STAR 1321

N75-30482/4GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

A Method for Calculating a Real-Gas Two-Dimensional Nozzle Contour Including the Effects of gamma.
C. B. Johnson, and L. R. Boney. Sep 75, 40p
NASA-TM-X-3243, L-10144

Descriptors: *Method of characteristics, *Nozzle design, *Real gases, *Specific heat, Axisymmetric bodies, Ideal gas, Two dimensional bodies, User manuals (Computer programs).

For abstract, see STAR 1321

SAND-75-8610 PC$4.00/MF$2.25
Sandia Labs., Livermore, Calif.
Natural Convection of a Heat-Generating Fluid within Closed Vertical Cylinders and Spheres.
R. J. Kee, C. S. Landram, and J. C. Miles. Apr 75, 17p CONF-750804-8
Contract AT(29-1)-789

Descriptors: (*Fluids, *Natural convection), (*Tritium, Natural convection), Cylinders, Grashof number, Heat transfer, Measuring methods, Nusselt number, Prandtl number, Spheres, Temperature distribution.

For abstract, see NSA 32 08, number 19600.

20E. Masers and Lasers

AD-A015 790/9GA PC$3.25/MF$2.25
Maryland Univ College Park Coll of Engineering
Effect of Kinetic Rate Uncertainties on Gasdynamic Laser Gain and Energy Predictions,
John D. Anderson. 13 Jan 74, 6p Rept no. Paper-74-176 AFOSR-TR-75-1452
Grant AF-AFOSR-2575-74
Availability: Pub. in AIAA Jnl., v12 n12 p1699-1703 Dec 74.

Descriptors: *Gas dynamic lasers, *Carbon dioxide lasers, *Infrared lasers, Temperature, Mathematical models, Computer programs, Gain, Carbon dioxide, Mixtures, Water vapor, Energy transfer, Reprints.
Identifiers: Vibrational energy, Rate equations.

Using an existing computer code, a study is made of the sensitivity of gasdynamic laser calculations to uncertainties in the vibrational energy exchange rates associated with CO2-N2-H2O gas mixtures. The results show that calculations of gasdynamic laser gain and maximum available energy in the laser cavity can be subject to noticeable inaccuracy due to rate data uncertainities. Moreover, those rates to which the calculations are most sensitive are clearly delineated. (Author)

AD-A015 791/7GA PC$3.25/MF$2.25
Indiana Univ Bloomington Dept of Physics
Relative Transition Probabilities in DeExcitation of Atomic States by Collisional Quenching: Cs 62P1/2 Yields 62S1/2,
F. A. Franz, R. Boggy, and C. E. Sooriamoorthi. 27 Jun 74, 11p AFOSR-TR-75-1453
Grants AF-AFOSR-2652-74, AF-AFOSR-1686-69
Availability: Pub. in Physical Review A, v11 n1 p1-9 Jan 75.

Descriptors: *Atomic spectra, *Masers, Nitrogen, Cesium, Optical pumping, Transport properties, Quenching, Interactions, Probability, Excitation, Reprints.

No abstract available.

AD-A015 872/5GA PC$6.25/MF$2.25
Naval Research Lab Washington D C
ARPA/NRL X-Ray Laser Program - Semiannual Technical Report to Defense Advanced Research Projects Agency, 1 January 1975-30 June 1975.
Sep 75, 171p Rept no. NRL-MR-3130
ARPA Order-2694
See also report dated May 75, AD-A010 516.

Descriptors: *Lasers, *Laser pumping, *Ultraviolet lasers, Pulsed lasers, Plasma oscillations, Interactions, Charge transfer, X rays, Traveling waves, Electron transport, Focusing, Mixing, Collisions.
Identifiers: *X ray lasers.

The ARPA/NRL x-ray laser program is concerned with demonstrating gain in the soft x-ray region. The program is jointly supported by ARPA and NRL. The approaches include electron-collisional pumping in picosecond laser pumped plasmas, resonant charge transfer pumping, optical parametric mixing to short wavelengths, traveling wave e-beam pumping, and analysis and numerical modeling. This report covers the progress made during the second half of FY-75. (Author)

AD-A015 935/0GA PC$3.75/MF$2.25
Maryland Univ College Park Dept of Aerospace Engineering
Navier-Stokes Solutions for Chemical Laser Flows. Part I. Cold Flows.
Interim rept.,
Ajay P. Kothari, and John D. Anderson, Jr. Jun 75, 50p Rept no. AE-75-6 AFOSR-TR-75-1447
Grant AF-AFOSR-2575-74

Descriptors: *Chemical lasers, *Supersonic flow, *Navier Stokes equations, Laminar flow, Mixing, Gas dynamics, High frequency, Thermal conductivity.
Identifiers: *Hydrogen fluoride lasers.

This work is part of an overall effort to apply detailed and accurate computational fluid dynamic techniques to the solution of practical high energy laser flows. In particular, the complete Navier-Stokes equations are used to calculate the supersonic laminar mixing flows associated with HF chemical lasers. Multicomponent diffusion is treated in a detailed fashion. Solutions are obtained for 'cold flows', where the effects of chemical reactions and vibrational relaxation are not included. Although such a situation is purely artificial, the results do isolate some of the fluid dynamic aspects of chemical laser flows, and provide a set of data to be compared later with hot flow calculations. These results also lend encouragement that solving chemical laser flows by means of the complete Navier-Stokes equations is feasible. Finally, a set of numerical experiments using four different time-dependent finite-difference schemes show that relatively minor changes in the differencing procedure can lead to major variations in the results. A modification of the well-known MacCormack approach appears to be the best suited for mixing flows associated with chemical lasers.

AD-A016 001/0GA PC$3.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
Pulse Chirping in a Nd:YAG Laser.
Rept. for Sep-Dec 73,
Chandler J. Kennedy. 14 Dec 73, 4p Rept no. AFAL-TR-75-142
Availability: Pub. in Jnl. of Quantum Electronics, vQE-10 n6 p528-530 Jun 74.

Descriptors: *Neodymium lasers, Mode locked lasers, Avalanche diodes, Photodiodes, Interferometers, Modulators, Pulsed lasers, Reprints.
Identifiers: Frequency doubling, Chirping.

The 1.06 micron output of a loss-modulated and frequency doubled Nd:YAG laser was examined using a microwave avalanche photodiode with a rise time of 40ps, and a scanning Fabry-Perot interferometer. The pulses were found to be transform limited only in the case where the .53 micron output of the laser was suppressed. When conversion efficiency was restored, the spectrum exhibited narrowing, but the pulses were much wider than the transform limit, indicating the presence of chirping. (Author)

AD-A016 002/8GA PC$3.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
Stability of an Intracavity Frequency Doubled Nd:YAG Laser.
Rept. for Jun 73-Jan 74,
Chandler J. Kennedy, and James D. Barry. 1 Feb 74, 5p Rept no. AFAL-TR-75-143
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE-10 n8 p596-599 Aug 74.

Descriptors: *Neodymium lasers, Laser cavities, Stability, Frequency, Oscillation, Coupling(Interaction), Damping, Relaxation, Reprints.
Identifiers: Frequency doubling.

Single mode rate equations are solved in the small signal limit to determine the oscillation frequency and decay constant for relaxation oscillations in an intracavity frequency doubled Nd:YAG laser. It is found that improved stability is noted for nonlinear coupling constants greater than 0.00001. Eventually, cavity perturbations become critically damped with increased coupling, and oscillatory behavior disappears. (Author)

AD-A016 046/5GA PC$6.25/MF$2.25
Naval Weapons Center China Lake Calif
Near-Ultraviolet Lasing Dyes. Part 1. Search for New Dyes and Summation of Results.
Rept. for Jun 74-Jun 75,
Peter R. Hammond , Aaron N. Fletcher, Ronald A. Henry, Ronald L. Atkins, and Donald W. Moore. Sep 75, 155p Rept no. NWC-TP-5768-Pt-1

Descriptors: *Ultraviolet lasers, *Tunable lasers, *Dyes, *Laser materials, Dye lasers, Flash lamps, Synthesis(Chemistry), Quinolines, Fluorescence, Coumarins, Optical pumping, Test methods, Near ultraviolet radiation, Pyridines, Nitrogen heterocyclic compounds.

The object of this investigation was to obtain improved laser dyes with outputs within the 380- to 400-nm region having low thresholds, high slope efficiencies, high photochemical stabilities, and operating under long-pulse flashlamp excitation. A combined search, synthesis, and test program examined four approaches: (1) substituent effects on known efficient bicyclic dyes such as the coumarins, (2) aza-substitution in the benzo-ring of such bicyclic compounds, (3) a class of monocyclic dyes, and (4) other miscellaneous compounds having strong fluorescence in or near the target region. Close to 70 new compounds were prepared and about half of the materials examined lased under short-pulse flashlamp excitation within the 350- to 450-nm range. Of six dyes operating within the 380- to 400-nm target region only two, 7-dimethylamino-1- methyl-4-methoxy-8-azaquinolone-2 and 7-hydroxy- 4-methyl-8-azaquinolone-2, satisfied specifications, although they were not as efficient as the coumarins.

AD-A016 065/5GA PC$3.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
CO Laser Gas Temperature.
Rept. for Jun-Dec 73,
J. D. Barry, and J. E. Brandelik. 22 Aug 73, 3p Rept no. AFAL-TR-75-144
Availability: Pub. in Applied Optics, v12 n12 p2809 Dec 73.

Descriptors: *Carbon monoxide lasers, *Temperature measuring instruments, Heat transfer coefficients, Electrical lasers, Gas discharges, Electric discharges, Heat of vaporization, Liquid nitrogen, Cooling, Transition temperature, Reprints.

The gas translational temperature of a slowly flowing, liquid nitrogen cooled, directly excited CO laser has been determined by rather simple means. The experimental method used allows laser gas temperatures to be determined rapidly without complicated and involved measurement procedure. The evaporation rate of the liquid nitrogen from the insulated cooling jacket about the laser discharge was measured and used to calculate the laser gas temperature. The evaporation rate indicates the heat flow through the discharge tube wall to the liquid nitrogen and thereby defines the temperature of the laser gas at the inner wall boundary. The gas temperature at the tube center follows by simple thermodynamic theory.

AD-A016 068/9GA PC$3.25/MF$2.25
California Univ Berkeley
Microfabrication of Two-Dimensional Periodic Arrays by Laser Beam Interferometric Technique,
Won-Tien Tsang, and Shyh Wang. 24 Feb 75, 5p ARO-11833.14-EL
Grant DAHC04-74-G-0070
Availability: Pub. in Applied Physics Letters, v27 n2 p79-82, 15 Jul 75.

Descriptors: *Gratings(Spectra), *Diffraction gratings, *Photoengraving, *Laser beams, Fabrication, Interferometers, Photographic processing, Real time, Photochemical reactions, Low costs, Microstructure, Reprints.
Identifiers: SED(Simultaneous exposure and development), Simultaneous exposure and development, Exposure(Photography), Development(Photography), Periodic structures, Microfabrication, Photoresist gratings.

Two-dimensional periodic arrays of circular openings with submicrometer diameter and spacing in thin photoresist films coated on top of glass substrates have been fabricated using a laser beam interferometric technique coupled with the simultaneous exposure and development (SED) method. The two-dimensional grating masks generated in this way are comparable in quality to those generated by computer-controlled scanning electron beam (CCSEB). Important advantages of the method described are that it is simple in both skill and instrumentation involved and that it is economic, fast, free of electron scattering and electrical charging problems, flexible, and able to generate large areas of uniform arrays. However, with this technique only periodic lattice structures can be generated. Possible new applications utilizing these structures are discussed.

AD-A016 074/7GA PC$3.25/MF$2.25
Oregon Univ Eugene Dept of Physics
Feasibility of Coherent X-Ray Production by X-Ray Pumping,
Bernd Crasemann, and Paul L. Csonka. 15 Jul 74, 5p ARO-12838.7-P
Grant DAHC04-75-G-0021
Availability: Pub. in Physical Review A, v12 n2 p611-614 Aug 75.

Descriptors: *Lasers, *Soft x rays, *Coherent radiation, Stimulation(General), Lithium, Bremsstrahlung, Synchrotrons, Lithium hydride, Electron beams, Reprints.
Identifiers: *X ray stimulated emission, X ray pumping, Pumping(X rays), Synchrotron radiation, Stimulated emission, Fast electrons, K absorption edge.

It is suggested that coherent soft x rays can be produced by inverting the electron population in a suitable target, such as Li, through irradiation with x rays generated by fast electrons traversing an electromagnetic field (as in a storage ring). Conditions to be satisfied by target and radiation parameters are stated, and examples given. (Author)

N75-30525/0GA PC$7.25/MF$2.25
National Aeronautics and Space Administration. Wallops Station, Wallops Island, Va.
The Use of Lasers for Hydrographic Studies.
H. H. Kim, and P. T. Ryan. 1975, 202p NASA-SP-375
Conf-Symp. Held at Wallops Island, VA., 12 Sep. 1973.

Descriptors: *Hydrography, *Laser applications, *Optical radar, *Remote sensors, *Water pollution, Airborne equipment, Algae, Bathymeters, Depth measurement, Oceanography, Oil slicks, Technology utilization.

For abstract, see STAR 1321

N75-30540/9GA PC$7.00/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Balancing of Rotating Bodies by Laser Beam.
V. M. Suminov, and A. K. Skvorcheskiy. Aug 75, 195p NASA-TT-F-16374
Contract NASW-2483
Tran-Transl. Into English of the Book "Uravnoveshivaniye Vrashchayushchikhsya Tel Luchom Lazera" Moscow, Mashinostroyeniye Press, 1974 p 1-175.

Descriptors: *Gas lasers, *Laser applications, *Mass balance, *Rotors, Laser outputs, Light beams, Performance prediction.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30544/1GA PC$3.75/MF$2.25
Technion - Israel Inst. of Tech., Haifa. Dept. of Aeronautical Engineering.
The Role of Gas Flow and Turbulence in Electric Discharge Lasers.
J. Shwart, and E. Wasserstrom. 1974, 39p TAE-245

Descriptors: *Carbon dioxide lasers, *Electric discharges, *Gas flow, *Turbulence effects, Flow distribution, Laser cavities, Mathematical models, Numerical analysis.

For abstract, see STAR 1321

PAT-APPL-453 241/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Dual Field Excitation for a Carbon Dioxide Laser.
Patent Application,
Sol Aisenberg, and Kuo Wei Chang. Filed 21 Mar 74, 18p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Carbon dioxide lasers, *Excitation, Patents, Gas dynamics, Gas lasers, Nitrogen, Electric discharges, Glow discharges, Plasmas(Physics), Cathodes, Anodes, Collisions, High pressure.
Identifiers: *Patent applications, PAT-CL-331-94-5.

An object of the patent application is to reduce the energy requirements of a high pressure gas laser. One embodiment of the invention consists of a row of auxiliary electrodes, each electrode consisting of a cathode and anode which independently maintains an auxiliary discharge. A principal discharge is maintained between a large flat or cylindrical anode and a virtual cathode which is created within the body of a glow plasma produced by the auxiliary electrodes. A principal discharge is maintained transverse to the auxiliary discharge and independently thereof to accelerate the electrons and effect the number of collisions between the electrons and the gas molecules. The present device permits a wider range of operating parameters of a CO2 laser than is available through prior art devices.

PAT-APPL-589 503/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Laser Receiver Anti-Sun Circuit.
Patent Application,
Jon H. Bumgardner. Filed 23 Jun 75, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Receivers, Patents, Lasers, Optical equipment, Overload, Control, Circuits, Feedback, Sensitivity, Signal to noise ratio, Sunlight.
Identifiers: *Patent applications, PAT-CL-250-205.

The patent application relates to a circuit for preventing laser receiver overload caused by sunlight wherein a feedback network provides a d.c. current to cancel the d.c. level of the diode current; and, a receiver design alternative to conventional designs wherein higher sensitivity is provided by maximizing the signal to noise ratio and processing by dual equalization to reshape the frequency response to achieve a flat response over the frequency range of interest.

UCRL-75490 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Review of Bound Free Laser Systems.
C. K. Rhodes. 14 Feb 74, 6p CONF-740404-3

Descriptors: (*Gas lasers, *Performance), Electrons, Excitation, Operation, Relativistic range, Reviews.

For abstract, see NSA 32 08, number 19546.

20F. Optics

AD-A015 636/4GA PC$3.25/MF$2.25
National Bureau of Standards Washington D C Inst for Basic Standards
Optical Materials Characterization.
Semi-annual technical rept.,
Albert Feldman, Deane Horowitz, Rory M. Waxler, Irving H. Malitson, and Marilyn J. Dodge. Aug 75, 24p Rept no. NBSIR-75-781
ARPA Order-2620
See also report dated Jan 75, AD/A-005 410.

Descriptors: *Infrared windows, *Infrared optical materials, *Laser materials, Infrared lasers, Zinc selenides, Germanium, Potassium chloride, Potassium compounds, Iodides, Refractive index, Single crystals, Photoelasticity, Measuring instruments, Test equipment, Vapor deposition, Temperature, Interferometry, Stresses.
Identifiers: Chemical vapor deposition, Potassium iodide.

The refractive index of each of two prismatic samples of chemical vapor deposited (CVD) ZnSe was measured from 0.5086 micrometer to 18.2 micrometers by means of the minimum-deviation method on a precision spectrometer. Data were obtained at temperatures near 20C and 34C and each set of data was fitted to a three-term Sellmeier-type dispersion equation, which permits refractive index interpolation within several parts in 0.00001. From the data obtained at the two temperatures, dn/dT was calculated for both samples. A comparison of refractive index and dn/dT is made with other types of ZnSe. Preliminary photoelastic data are presented for single crystal specimens of Ge,

reactive atmosphere processed (RAP) KCl, and KCl doped with KI. The Ge data, which was obtained at 10.6 micrometers differ from previously reported data. Data on the two types of KCl were obtained at 0.633, 0.644 and 10.6 micrometers. These data are compared with values from the literature. Also presented are revised photoelasticity data for CVD ZnSe. The design of an improved stressing apparatus that was developed for the measurement of photoelastic constants is discussed.

AD-A015 674/5GA PC$3.75/MF$2.25
United Technologies Research Center East Hartford Conn
Infrared Waveguide Modulators at Microwave Frequencies.
Semi-annual technical rept. no. 6, 25 Aug 72-25 Aug 76,
P. K. Cheo, M. Gilden, and R. Wagner. 30 Sep 75, 34p Rept no. UTRC/R75-922241-1
Contract N00014-73-C-0087, ARPA Order-1860

Descriptors: *Light modulators, *Optical waveguides, Gratings(Spectra), Prisms(Optics), Strip transmission lines, Carbon dioxide lasers, Infrared lasers, Far infrared radiation, Broadband, High resolution, Ku band, Gallium arsenides, Germanium, Laser beams, Couplers, Copper.
Identifiers: *Infrared modulators, *Integrated optics.

The long-range objective of this program is to develop an efficient and reliable ultra-wideband waveguide modulator for CO2 lasers that will be useful for high resolution, imaging optical radars and high-data-rate optical communication systems. Efficiency and reliability are obtainable by using integrated optics technology. During the reporting period (April 1975 to September 1975), major objectives are: (1) to develop techniques that will improve the quality and strength of the infrared waveguide structure, (2) to establish the relative advantages of grating and prism couplers, and (3) to establish the micro wave characteristics of microstrip modulator configuration. These developments are essential for the generation of the predictable level of sideband power at 16 GHz.

AD-A015 759/4GA PC$3.75/MF$2.25
Avco Everett Research Lab Inc Everett Mass
Turbulence Characterization and Control.
Technical rept. 1 Aug 74-31 Jan 75,
M. G. Miller, and P. F. Kellen. Jul 75, 42p
Contract F30602-75-C-0012, ARPA Order-2646

Descriptors: *Light transmission, *Optical images, Atmospheric motion, Turbulence, Optical equipment, Telescopes, Interferometers, Data processing, Test equipment, Optical instruments, Astronomical observatories, Astronomical instruments, Hawaii.
Identifiers: *Atmospheric transmissivity, Atmospheric attenuation.

This report covers investigations of atmospheric turbulence effects related to optical imaging. Three specific subjects are discussed. The first is the initial seeing survey carried out in 1962-63 at the ARPA Maui Observation Station (AMOS) on the summit of Haleakala, Maui, Hawaii. These measurements involved the visual observation of planetary features using a 12.5 inch Newtonian reflector. It was concluded that the presence and/or operation of the observatory has disturbed the excellent natural seeing characteristics which may have existed at the site. In order to provide additional information on this subject the authors carried out a series of measurements of the differential angle of arrival variance at AMOS during August 1974. Stellar sources, a seven inch telescope and a Hartmann test procedure were used to collect the data. The final subject is a study of local turbulence control practices used by the astronomical community.

AD-A015 771/9GA PC$3.25/MF$2.25
Institute for Telecommunication Sciences Boulder Colo
Pressure-Scanning mm-Wave Dispersion Spectrometer,
H. J. Liebe. 18 Feb 75, 10p ARO-12233.2-GS
Availability: Pub: in Review of Scientific Instruments, v46 n7 p817-825 Jul 75.

Descriptors: *Spectrometers, *Microwave spectroscopy, Gases, Oxygen, Line spectra, Reprints.

A differential refraction spectrometer for measuring the absolute intensity distribution of microwave spectra in gases by means of dispersion pressure profiles is described. The instrument was applied to study the 60 GHz band spectrum of oxygen under simulated atmospheric conditions.

AD-A015 861/8GA PC$3.25/MF$2.25
Danish Meteorological Inst Copenhagen Geophysical Dept
Ionospheric Research Using Satellites.
Interim scientific rept. no. 4, 1 Jul 74-30 Jun 75,
Ib Steen Mikkelsen. 27 Aug 75, 5p AFCRL-TR-75-0495
Grant AF-AFOSR-2161-72

Descriptors: *Faraday effect, *Ionosphere, Rotation, Photoionization, Computer programs, Greenland, Winter, Maps, Summer, Contours, Electrons.
Identifiers: TEC(Total Electron Content), Total electron content.

ATS-3 Faraday-rotation data gathered at Narssarssuaq, Greenland, during the period 72/04/20 - 74/06/11 has been analyzed. This was done by drawing contour-maps of the total electron content (TEC) with the aid of a computer program. These show the general changes of TEC with increasing Kp. It is found that the day-time values of the winter 73-74 are low compared to the winter of 72-73 and are possibly a signature of a long time variation of the solar activity. (Author)

AD-A015 897/2GA PC$4.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Optical Methods of Determining Distribution Spectra of Particles,
A. E. Mikirov. 7 Nov 73, 65p Rept no. FSTC-HT-23-1474-73
Trans. of Institut Prikladnoi Geofiziki, Leningrad. Trudy (USSR) n15 p45-102 1969.

Descriptors: *Upper atmosphere, *Atmospheric scattering, *Particles, Optical properties, Particle size, Spectra, Integral equations, Translations, USSR.
Identifiers: Optical spectra.

The author derives various size distributions for atmospheric scattering particles with and without any assumptions about the form of the distribution function. The derivations use the dependence of the scattering particles on the wavelength and the dependence of the scattering indicatrix on the scattering angle. The results which are obtained from solving integral equations are given in tabular form.

AD-A016 048/1GA PC$4.75/MF$2.25
Sperry UNIVAC St Paul Minn Defense Systems Div
Stripe Domain Light Deflector.
Final rept.,
D. L. Fleming, T. R. Johansen, F. G. Hewitt, and E. J. Torok. 30 Jul 75, 83p
Contract N00014-73-C-0308
See also report dated 1 Apr 75, AD-A012 410.

Descriptors: *Laser beams, *Deflectors, Optical materials, Yttrium iron garnet, Bismuth, Iron compounds, Chromium compounds, Halides, Bromides, Crystal growth, Beam steering, Memory devices, Optical radar, Line scanning, Epitaxial growth, Crystal structure.
Identifiers: Optical crystal memories, Liquid phase epitaxy, Chromium bromides.

A fast two dimensional solid-state light deflector with a very large number of resolvable spots is needed. It is critical not only for optical memories but also for displays, communication beam steerers, optical radar, optical processors and a host of other devices. The stripe domain light deflector is the newest type of light deflector; it is a solid state, fast, is random accessed in two dimensions, has wide temperature margins, has low power requirements, and has the potential of offering two orders of magnitude more resolvable spots than any other type of solid state deflector. This final report describes work carried out to develop and evaluate the prospects of using materials such as bismuth doped yttrium iron garnet (Bi: YIG) and iron chromium trihalides as stripe domain light deflector elements.

AD-A016 158/8GA PC$3.75/MF$2.25
New Mexico State Univ University Park Dept of Physics
Research in the Area of Atmospheric Modeling: High-Resolution Atmospheric IR Transmittance Prediction (Part II).
Interim rept. 1 Mar 74-30 Sep 74,
August Miller, Robert L. Armstrong, Charles W. Welch, and Robert P. Sandoval. Aug 75, 48p
Contract DAAD07-73-C-0134
See also report dated Jun 74, AD-780 914.

Descriptors: *Laser beams, *Light transmission, Atmospheres, Computer programs, Infrared radiation, Absorption spectra, Atmosphere models, FORTRAN, Infrared signatures, Target detection, Atmospheric scattering, Infrared lasers, Surface targets.
Identifiers: Atmospheric transmissivity, FORTRAN 4 programming language, ATRAN computer program.

The primary technological concern of the Target Signature Analysis (TSA) program is to locate, identify, and destroy stationary or moving ground targets through their infrared emission or reflective characteristics when viewed through low visibility atmospheric conditions. (The spectral band of interest is from 0.4 to 14 micrometers). The responsibility of the Atmospheric Sciences Laboratory (ASL) scientific group rests in the theoretical and empirical development of computerized models for the prediction of the attenuative effects of atmospheric scattering and absorption. The New Mexico State University (NMSU) scientific group is currently assisting this program with the investigation and testing of a computerized scattering model for predicting the attenuation of laser energy transmitted through atmospheric paths. In addition, they have previously assisted in reviewing and developing techniques for high resolution infrared transmittance in homogeneous atmospheres.

AD-A016 163/8GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
Installation and Operation of an Atmospheric Particulate Collector.
Technical rept.,
Carmine Petracca, and James D. Lindberg. Sep 75, 22p Rept no. ECOM-5575

Descriptors: *Aerosols, *Samplers, *Particulates, Collection, Sampling, Atmospheres, Dust, Refractive index, Air filters, Light transmission, Laser beams.
Identifiers: Atmospheric transmissivity, Design, Accumulators.

The Atmospheric Sciences Laboratory (ASL) at White Sands Missile Range (WSMR) NM, has an active program to measure the optical absorption coefficient of atmospheric particulate matter collected from a variety of world wide geographic locations as part of a mission objective to determine the potential adverse effects of such dust on military night vision, target designation, remote sensing, and other systems relying on propagation of light in the atmosphere. To insure that the samples collected from different localities can be directly compared, the sampling equipment and procedure must be standardized. This report describes the design details of the collector and procedure developed for this purpose. The collector uses a 47-millimeter-diameter 0.45-micrometer pore size membrane filter through which air is pulled by means of an auxiliary vacuum pump. Illustrations of operational details of the collector are included.

AD-A016 174/5GA PC$3.25/MF$2.25
New Mexico State Univ University Park Dept of Physics
The Use of Simple Observables to Predict Infrared Extinction Coefficient of Atmospheric Aerosols.
Final rept. 1 Oct 74-30 Jun 75,
G. H. Goedecke. 16 Sep 75, 29p ARO-12832.1-R-GS
Grant DAHC04-75-G-0033

Descriptors: *Laser beams, *Aerosols, Near infrared radiation, Atmospheres, Infrared radiation, Infrared lasers, Atmosphere models, Fog, Haze, Atmospheric scattering, Microstructure, Radiative transfer, Computer applications, Dispersion, Light transmission.
Identifiers: *Atmospheric transmissivity, Soot.

Several model aerosols of a given type, having the same visibility, but different yet reasonable microstructure, exhibit very wide dispersion, as much as 700%, in values of transmission at wavelengths from 2.0 to 10.6 micrometers. At near infrared wavelengths, from the visible to 2.0 micrometers, the dispersion is reduced, to a tolerable value of 10% at 1.06 micrometers. Two methods are suggested for exploiting the theoretical predictive techniques reported here. Results of a study designed to determine some of the effects of multiple scattering in low visibility situations (fog and a haze-soot mixture) indicate that laser system detectors of small solid angle register a transmission given very accurately by the single-scattering exponential transmission law, even for optical thickness greater than unity, but that detectors of large solid angle observe a considerably enhanced transmission for such optical depths. Also reported are results of two relevant but peripheral investigations, one concerning the application of dispersion relations to the complex reflectivity, the other concerning a necessary modification of radiative transfer theory under certain circumstances.

AD-A016 253/7GA PC$4.75/MF$2.25
Naval Weapons Center China Lake Calif
Near-Ultraviolet Lasing Dyes. Part 2. Effects of Coaxial Flashlamp Excitation.
Technical rept. Jun 74-Jun 75,
Aaron N. Fletcher. Sep 75, 78p Rept no. NWC-TP-5768-Pt-2

Descriptors: *Ultraviolet lasers, *Dye lasers, *Optical pumping, *Flash lamps, Near ultraviolet radiation, Tunable lasers, Xenon lamps, Fluid flow, Alignment, Photodiodes, Optical properties, Absorption(Physical), Test methods, Fluorescence, Excitation, Additives.

Methodology of evaluating a series of laser dyes using coaxial xenon flashlamp excitation is described. Lasing wavelengths, total output energies, and time/energy relationships were measured. Effects of additives, window alignment, concentration of dye, cover gas, flash characteristics, flow rate of solution, frequency of flashes, and the solvent were evaluated. Effects of variation of chemical substituents are described in Part 1 of this report.

AD-A016 258/6GA PC$4.75/MF$2.25
Rockwell International Corp Anaheim Calif Electronics Research Div
Hybrid Waveguides and Heterodyne Detectors Integrated Optics for 10 Micron Wavelengths.
Final technical rept. 15 Feb 73-30 Nov 74,
D. B. Anderson , R. R. August, J. T. Boyd, R. L. Davis, and J. D. McMullen. 28 Feb 75, 87p Rept no. C73-291.12/501
Contract N00014-73-C-0297, ARPA Order-2327

Descriptors: *Optical waveguides, *Electrooptics, *Laser modulators, *Infrared detectors, Laser beams, Infrared lasers, Carbon dioxide lasers, Photoconductors, Gold, Antimony, Germanium, Semiconductor doping, Heterodyning, Frequency modulation, Frequency shift, Gallium arsenides, Traveling waves, Transmitter receivers, Optical communications.
Identifiers: *Integrated optics, Heterodyne detection, Optical modulators.

The infrared integrated optics technology for use in the ten micrometer region of the spectrum has been developed as reported herein, comprising a traveling-wave photoconductive heterodyne detector as may be applied to CO2 laser receiver systems. The effort reported herein specifically addresses extrinsic photoconduction in gold-doped, antimony-compensated germanium at 77K in a rectangular waveguide structure and using a gallium-arsenide substrate. A traveling-wave structure is employed wherein the input infrared waveguide is phase matched with the output electrical signal transmission line which also serves as the bias electrodes. Both the slot and strip configuration of the output signal transmission line were investigated. An analysis of the traveling-wave heterodyne detector structure includes the waveguides and phase matching; carrier excitation, lifetime, and diffusion; and detector operation and performance. The analysis of the traveling-wave structure shows that its intrinsic circuit bandwidth extends through the microwave range.

AD-922 651/5GA PC$4.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
Laser Radar Technology.
Final rept. Jan-Aug 74,
K. T. Yano, L. O. Heflinger, G. L. Clark, and M. A. Kolpin. Sep 74, 90p TRW-23897-6003-RU-00 RK-CR-75-12
Contract DAAH01-74-C-0339
Distribution limitation now removed.

Descriptors: *Chemical lasers, *Optical radar, *Infrared lasers, *Infrared detectors, Hydrogen fluroide, Light pulses, Deuterium compounds, Heterodyning, Molecular spectroscopy, Discharge tubes, Pulse generators, Interferometers, Line spectra, Infrared spectra, Carbon dioxide lasers, Sizes(Dimensions), Weight, Efficiency, Frequency stabilizers, Oscillators, Plasma medium, Dissociation, Helium, Sulfur compounds, Deuterium, Fluorides, Radar targets, Backscattering, Diffuse reflection, Refractive index, Ionization, Gain, Energy, Intermediate infrared radiation.
Identifiers: *Deuterium fluoride laser, *Hydrogen fluoride laser, *Chain reaction lasers, Sulfur hexafluoride, Local oscillators.

This report is a study made to assess the feasibility of using a pulsed chemical laser as a laser radar transmitter. The electrically-initiated pulsed chain-reaction chemical laser offers substantial improvement of performance over conventional electric CO2 lasers. This improved performance is in higher efficiencies and higher specific energies which tend to decrease the overall system's size and weight. The performance calculations of a pulsed chemical D2-F2 laser are described. These include computations dealing with the multiple-line output of the chemical laser, and also computations of performance for a laser constrained to operate on discrete lines.

BNL-20337 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Bragg Reflection Program.
J. W. Lynn. 15p

Descriptors: (*Computer codes, *B codes), (*Bragg reflection, Computer codes), Pdp computers.

For abstract, see NSA 32 08, number 21789.

COM-75-11375/3GA PC$3.25/MF$2.25
National Bureau of Standards, Washington, D.C.
Optical Materials Characterization.
Semiannual technical rept. 1 Jan75-31 Jul 75,
Albert Feldman, Deane Horowitz, Roy M. Waxler, Irving H. Malitson, and Marilyn J. Dodge. Aug 75, 25p NBSIR-75-781
ARPA Order-2620
See also report dated Jan 75, COM-75-10135.

Descriptors: *Infrared lasers, *Infrared windows, *Laser materials, Zinc selenides, Potassium chloride, Potassium iodides, Germanium, Refractive index, Vapor deposition, Photoelasticity, Stresses, Optical properties.
Identifiers: Chemical vapor deposition.

The refractive index of each of two prismatic samples of chemical vapor deposited (CVD) ZnSe was measured from 0.5086 micrometer to 18.2 micrometers by means of the minimum-deviation method on a precision spectrometer. Data were obtained at temperatures near 20C and 34C and each set of data was fitted to a three-term Sellmeier-type dispersion equation, which permits refractive index interpolation within several parts in 10 to the -5th power. From the data obtained at the two temperatures, dn/dT was calculated for both samples. A comparison of refractive index and dn/dT is made with other types of ZnSe. Preliminary photoelastic data are presented for single crystal specimens of Ge, reactive atmosphere processed (RAP) KCl, and KCl doped with KI. The Ge data, which was obtained at 10.6 micrometers differ from previously reported data. Data on the two types of KCl were obtained at 10.6 micrometers, 0.633 micrometer and 0.644 micrometer. These data are compared with values from the literature. Also presented are revised photoelasticity data for CVD ZnSe. The design of an improved stressing apparatus that was developed for the measurement of photoelastic constants is discussed.

LA-UR-75-839 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Laser Application of Heat Pipe Technology in Energy Related Programs.
R. J. Carbone. 1975, 16p CONF-750812-11
Contract W-7405-ENG-36

Descriptors: (*Gas lasers, *Design), Feasibility studies, Heat pipes, Metals, Vapors.

For abstract, see NSA 32 08, number 19545.

PAT-APPL-561 017/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Inertial Optical Stabilizer.
Patent Application,
Frederick C. Allard. Filed 21 Mar 75, 8p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Gyro stabilizers, Patents, Line of sight, Optical equipment, Inertial systems.
Identifiers: *Patent applications, PAT-CL-74-5-6-B.

The patent application describes gyroscope instrumentation for providing stabilization of the direction of a line-of-sight of more than 45 degrees about one or more axes utilizing a two axes optical system. An inner gimbal supports a gyro rotor and a first mirror diagonal with a clearance window to admit light. The gyro rotor keeps the first mirror aligned in a fixed direction relative to an inner gimbal axis. The inner gimbal is supported by an outer gimbal. The outer gimbal has a second mirror mounted on it. The gyro rotor keeps the second mirror aligned with the outer gimbal axis. The net effect is that the optical axis at the input has a fixed orientation in space and the optical axis at the output axis has a fixed orientation relative to a platform on which the system is mounted.

PAT-APPL-571 194/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Process and Apparatus for Producing High Precision Laser Mirror Seats.
Patent Application,
David C. Grant, and Harvey A. Smith. Filed 24 Apr 75, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Lasers, *Mirrors, Patents, Alignment, Optical equipment, Machining.
Identifiers: *Patent applications, PAT-CL-51-281.

The patent application concerns a process for wearing away precision mirror surfaces in such a manner as to precisely control the angles and depth of the resulting seats. Circular laps are used with rotary motion to prepare circular seats and segmented laps are used with oscillatory motion to prepare local seat segments. Vibration excitation using a piezoelectric crystal is provided for in a plane perpendicular to and in combination with the rotary and oscillatory motions. Also disclosed is apparatus for positioning the laps in parallel alignment with an optical plane within positional accuracies of + or - .1 arc seconds.

PAT-APPL-576 496/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Acousto-Optically Tuned Laser.
Patent Application,
Richard S. Hughes, Michael Inbert, and Thomas Wooricki. Filed 12 May 75, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Tunable lasers, *Tuning devices, Patents, Acoustooptics, Reflectors, Prisms(Optics), Crystal filters.
Identifiers: *Patent applications, PAT-CL-350-149, Organic dye lasers.

The patent application concerns a tunable laser wherein the tuning element is intracavity and comprises a polarizing prism for linearly polarizing the beam, and an electronically tunable filter backed by a retroreflective surface.

PAT-APPL-580 856/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Fiber Optic Grinding and Polishing Tool.
Patent Application,
Adolph L. Lewis. Filed 27 May 75, 14p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fiber optics, *Cables, *Grinding wheels, Patents, Alignment, Abrasion.
Identifiers: *Patent applications, PAT-CL-51-3.

The patent application concerns a hand-held fiber optic grinding and polishing tool for finishing ends of fiber optic cables includes a motor mounted in a hand-held body member for rotatably driving a disc. The disc has a circular planar surface with multiple discrete concentric sections, each section having a different degree of abrasive surface for grinding and polishing. A fiber optic cable guide is supported on the hand-held body member and has multiple ports to receive fiber optic cable ends, each of the ports being aligned with one of the concentric abrasive sections and configured to position the fiber optic cable ends for a predetermined amount of grinding and polishing. In a preferred embodiment the fiber optic cable guide is removable to permit selective replacement by alternate guide members accommodating different sizes of fiber optic cable ends.

PAT-APPL-584 321/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
An Integrated Optical Data Bus Coupler.
Patent Application,
Lynn D. Hutcheson, and Nicholas Battka. Filed 6 Jun 75, 10p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fiber optics, *Light modulators, *Semiconductor devices, Patents, Gallium arsenides, Coupling circuits, Optical communications, Electrooptics, Integrated circuits, Photodetectors, Semiconductor diodes, Avalanche diodes, Data transmission systems.
Identifiers: *Patent applications, Integrated optics, PAT-CL-350-160.

The patent application concerns a data bus coupler having a fiber optic bundle input, a separate optical modulator or detector (described in a concurrent disclosure by the same inventors) attached to each fiber of the bundle for adding information to, extracting information from, or detecting the information conducted by the fiber, and an output wherein the fibers are rejoined into a fiber optic bundle. The optical modulator/detectors are GaAs double heterojunction semiconductors that are switched 'on' by reverse biasing and with large voltages they may act as photoavalanche diodes when detecting incident radiation.

PAT-APPL-608 482/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Binocular Attachment.
Patent Application.
W. H. King. Filed 28 Aug 75, 9p NASA-CASE-LAR-11782-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Binoculars, *Display devices, *Navigation aids, Analog to digital converters, Lens design, *Patent applications, Sensors.

Apparatus for superimposing numerical information on the field of view of binoculars and applicable in the flying of radio-controlled model airplanes is described. Airspeed and angle of attack are sensed by sensors attached to the model airplane, telemetered to ground, and converted to numerical form. An optical system is used to display the numerical information in the field of view of the binoculars used to track the model airplane. The numerical information is focused at infinity by collimating lens enabling the user to see the object and numerical information without refocussing his eyes.

20G. Particle Accelerators

AD-A015 896/4GA PC$4.25/MF$2.25
Austin Research Associates Inc Tex
Preliminary Design Parameters for the Auto-Resonant Acceleration of Protons Utilizing the FX-25 or FX-100 Electron Beam Sources.
Final rept. May-Dec 74,
William E. Drummond, George I. Bourianoff, David E. Hasti, William W. Riestra, and M. L. Sloan. Aug 75, 73p Rept nos. ARA-166, I-ARA-74-U-187 AFWL-TR-74-343
Contract F29601-74-C-0079

Descriptors: *Proton accelerators, *Electron beams, Ion accelerators, Plasmas(Physics).

Auto-resonant acceleration is a collective acceleration scheme using the lower branch of the electron cyclotron eigenmode of a relativistic electron beam propagating along a magnetic guide field in a conducting cylinder to trap and accelerate ions. The theory of Auto-resonant acceleration is discussed and constraints imposed upon the e-beam, guide field, geometry of the conducting cylinder, and resulting ion beam are derived. These are then used to develop preliminary design criteria for Auto-resonant accelerators using the FX-25 and FX-100 as electron beam sources.

AD-A015 940/0GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Collective Ion Acceleration in a Converging Waveguide.
Memorandum rept.,
P. Sprangle, W. M. Manheimer, and A. T. Drobot. Oct 75, 16p Rept no. NRL-MR-3138

Descriptors: *Ion accelerators, Electron beams, Space charge, Dispersion relations.

An ion acceleration mechanism is proposed in which ions are trapped and accelerated by a negative energy space charge wave. Under certain conditions, an electron beam propagating down a slowly converging metal guide can be accelerated. A low phase velocity space charge wave initiated at the large radius end of the guide, because it is supported by the beam, will also accelerate. By trapping ions in the potential wells of a low phase velocity negative energy wave, ion acceleration down the converging drift tube, can be achieved. The ion acceleration leads to the growth in amplitude of the negative energy space charged wave, thus maintaining the trapping.

AECL-5032 PC$7.75/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
Physics Division Progress Report, October 1 to December 31, 1974.
Jan 75, 95p
U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, *Operation), (*Nuclear physics, *Research programs), Aecl.

For abstract, see NSA 3208

CEA-CONF-3063 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. du Synchrotron Saturne.
Superconducting Pulsed Dipole "Alec".
G. Bronca, R. Boissier, P. Dubois, J. Ferry, and J. Maldy. 21 Apr 75, 5p CONF-750438-5
U.S. Sales Only.

Descriptors: (*Saturne, Superconducting magnets), (*Superconducting magnets, *Design), Fabrication, Iron, Lamellae, Magnet cores, Magnetic dipoles, Performance testing, Pulsed magnet coils, Specifications, Thermal expansion.

For abstract, see NSA 32 08, number 20455.

IEA-28 PC$4.25/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
Design of an Irradiation Chamber for an Industrial Electron Accelerator at 1.5 Mev and 25 Ma.
A. G. C. Castagnet, C. Szulak, and S. Nakahira. Mar 74, 22p
In Portuguese. U.S. Sales Only.

Descriptors: (*Dynamitrons, *Shielding), Design, Mev range 01-10, Milli amp beam currents, X-ray sources.

For abstract, see NSA 32 08, number 20456.

KFK-2141 PC$5.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Experimentelle Kernphysik.
Feasibility Study of a Postaccelerator for Ions of Medium Mass with Superconducting Helically Loaded Resonators.
H. Deitinghoff, H. Klein, M. Kuntze, J. E. Vetter, and E. Jaeschke. Apr 75, 36p
In German. U.S. Sales Only.

Descriptors: (*Accelerators, *Feasibility studies), (*Superconducting cavity resonators, *Design), (*Heavy ions, *Acceleration), Electric power, Electrostatic accelerators, Helical configuration.

For abstract, see NSA 32 08, number 20450.

LA-5954 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
100-Mhz Power Amplifier Design and Control for a Heavy-Ion Accelerator.
J. S. Lunsford, J. P. Shipley, and J. Sutton. Jul 75, 11p

Descriptors: (*Hilacs, Power amplifiers), (*Power amplifiers, *Design), Cavity resonators, Control systems, Electron tubes, Electronic circuits, Mhz range 01-100.

For abstract, see NSA 32 08, number 20457.

NP-20479 PC$7.25/MF$2.25
British Columbia Univ., Vancouver (Canada). TRIUMF Facility.
Triumf Annual Report, 1974.
Apr 75, 79p
U.S. Sales Only.

Descriptors: (*Triumf cyclotron, *Accelerator facilities), Beam analyzers, Beam dynamics, Control systems, Electromagnets, Ion beam injection, Ion sources, Meson factories, Operation, Planning, Power supplies, Research programs, Rf systems, Target chambers, Targets.

For abstract, see NSA 3208

RL-75-066 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
New Developments in the Magnet Design Computer Program Gfun.
A. G. A. M. Armstrong, C. J. Collie, N. J. Diserens, M. J. Newman, and J. Simkin. Mar 75, 16p
U.S. Sales Only.

Descriptors: (*Electromagnets, *Design), (*Computer codes, *G codes), Epic storage ring, Integral equations, Magnet coils, Magnetic field configurations, Mathematical models, Superconducting magnets, Variable energy cyclotrons.

For abstract, see NSA 32 08, number 20459.

RL-75-069 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Nimrod Operation and Development. Quarterly Report, January 1--March 31, 1975.
D. E. Gray. Apr 75, 14p
U.S. Sales Only.

Descriptors: (*Nimrod, *Operation), Research programs.

For abstract, see NSA 3208

TRI-PP-75-2 PC$4.00/MF$2.25
British Columbia Univ., Vancouver (Canada). Faculty of Medicine.
Accelerating Voltage Control and Stabilization in the Triumf Cyclotron.
R. H. M. Gummer. Mar 75, 4p CONF-750335-67

Descriptors: (*Triumf cyclotron, *Control systems), Automation, Breakdown, Camac system, Electric potential, Feedback, Logic circuits, Rf systems, Stabilization, Tuning.

For abstract, see NSA 32 08, number 20460.

TRI-PP-75-3 PC$4.00/MF$2.25
British Columbia Univ., Vancouver (Canada). Faculty of Medicine.
Triumf RF System.
R. L. Poirier, and M. Zach. Mar 75, 4p CONF-750335-68

Descriptors: (*Triumf cyclotron, *Rf systems), Cavity resonators, Dees, Design, Performance testing, Testing.

For abstract, see NSA 32 08, number 20461.

TRI-PP-75-4 PC$4.00/MF$2.25
British Columbia Univ., Vancouver (Canada). Faculty of Medicine.
Coma: A Linear Motion Code for Cyclotrons.
C. J. Kost, and G. H. Mackenzie. Mar 75, 4p CONF-750335-69

Descriptors: (*Triumf cyclotron, *Particle kinematics), (*Computer codes, *C codes), Fortran, Mathematical models, Matrices, Simulation.

For abstract, see NSA 32 08, number 20474.

TRI-PP-75-5 PC$4.00/MF$2.25
British Columbia Univ., Vancouver (Canada). Faculty of Medicine.
Initial Operating Experience with the Triumf 300 Kev H exp - Injection System.
J. Beveridge, E. W. Blackmore, P. F. Bosman, G. Dutto, and W. Joho. Mar 75, 4p CONF-750335-70

Descriptors: (*Triumf cyclotron, *Ion beam injection), Beam bunchers, Beam pulsers, Design, Electromagnets, Electrostatic lenses, Ferrite, Hydrogen ions 1 minus, Ion sources, Milli amp beam currents, Performance testing, Permanent magnets, Quadrupoles, Shielding.

For abstract, see NSA 32 08, number 20462.

20H. Particle Physics

AD-A015 747/9GA PC$3.25/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
The Treatment of Electron Scattering and Approximate Methods Used for Specifying High-Altitude EMP Sources.
Final rept. Jul 73-Dec 74,
John F. Morgan, and Gary R. Knutson. Apr 75, 25p Rept no. AFWL-TR-74-341

Descriptors: *Electromagnetic pulses, *Electron scattering, *X rays, Electron transport, High altitude, Monte Carlo method, Compton scattering, Gamma rays, Geomagnetism, Photons, Energy.
Identifiers: Monoenergetic electrons, Hemp computer code.

A Monte Carlo electron transport code was used to calculate the EMP sources produced (1) by monoenergetic electrons, (2) by a Compton scatter distribution of electrons, and (3) by a photoelectric scatter distribution of electrons. The effects of nuclear-coulomb electron scattering, of the continuous slowing down method of electron energy loss, and of electron turning in the geomagnetic field of the earth were included in the calculations. Analytic results were obtained from the source routine of AFWL one-dimensional high-altitude EMP code, HEMP B. Sources include an improved slowing down model and the option of two electron scatter approximations based on small angle scatter theory; one based on an average obiquity of the distribution, and the other based on a random selection of scattering direction. The Monte Carlo results are compared to the analytic methods for a delta function source of photons. (Author)

AD-A015 776/8GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Improved MCSCF Dipole Moment Function for NO(X2II),
Frank P. Billingsley, II. 10 Apr 75, 4p Rept no. AFCRL-TR-75-0506
Availability: Pub. in Jnl. of Chemical Physics, v63 n5 p2267-2269, 1 Sep 75.

Descriptors: *Nitrogen oxides, Dipole moments, Wave functions, Dissociation, Atoms, Ground state, Configurations, Molecular states, Asymptotic series, Reprints.

The dipole moment function and potential curve of the ground state of NO have been calculated with an improved multiconfiguration self-consistant field (MCSCF) wavefunction. The present calculations improve the previous MCSCF treatment of NO(X2II) by properly accounting for the asymptotic properties of the molecular wavefunction approaching the united atom limit. While no large differences in the two sets of calculations are observed in the calculated properties, the results do serve to point out the importance of proper attention to the asymptotic requirements of wavefunctions both at dissociation and the united atom limit. (Author)

AD-A016 067/1GA PC$3.25/MF$2.25
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
Second Born Approximation to Electron and Positron Impact Excitations of the 1 (1)S yields 2 (1)S Transition in Helium,
B. D. Buckley, and H. R. J. Walters. 25 Nov 74, 26p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics B: Atomic and Molecular Physics, v8 n10 p1693-1715 1975.

Descriptors: *Electrons, Particle collisions, Positrons, Impact, Excitation, Helium, Transitions, Cross sections, Reprints.

It is shown that the third-order second Born approximation, in which the second Born cross section is evaluated correct to only Third order in the interaction potential, gives poor results for electron impact excitation of the 1(1)S yields 2(1)S transition. The full second Born approximation, in which cross sections are calculated by squaring the modulus of the full second Born amplitude, is better but still not quite satisfactory.

AD-A016 073/9GA PC$3.25/MF$2.25
Georgia State Univ Atlanta Dept of Physics

Energy and Angular Distribution of Electrons Ejected from Helium by Fast Protons and Electrons: Theory and Experiment,
Steven T. Manson, L. H. Toburen, D. H. Madison, and N. Stolterfoht. 27 Feb 75, 22p
ARO-11332.2,P
Grants DAHC04-74-G-0217, NSF-GP-38905
Availability: Pub. in Physical Review A, v11 n1 p60-79 Jul 75.

Descriptors: *Electrons, Particle collisions, Protons, Helium, Energy, Impact, Ionization, Charged particles, Cross sections, Reprints.

A comprehensive study of the angular and energy distributions of electrons ejected in collisions of fast electrons and protons with He is presented. New experimental results for 300-keV, 1-MeV, and 5-MeV proton impact are reported along with theoretical results for 2-keV electron impact and 100-keV, 300-keV, 1-MeV, and 5-MeV proton impact. The theoretical results, based upon Born approximation with Hartree-Slater initial discrete and final continuum wave functions, show excellent agreement with experimental electron-impact results.

AERE-R-7785 PC$8.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Chain and Independent Fission Product Yields Adjusted to Conform with Physical Conservation Laws.
E. A. C. Crouch. Feb 75, 99p INDC(UK)-24(G), NEANDC(UK)-161
U.S. Sales Only.

Descriptors: (*Uranium 233, *Neutron reactions), (*Uranium 235, Neutron reactions), (*Uranium 238, Neutron reactions), (*Plutonium 239, Neutron reactions), Fission products, Fission yield, Plutonium 241, Thermal fission, Mev range 10-100, Fast neutrons, Fission, Plutonium 240, Thorium 232.

For abstract, see NSA 32 08, number 21257.

ANL/NDM-13 PC$5.25/MF$2.25
Argonne National Lab., Ill.
Response of Several Threshold Reactions in Reference Fission Neutron Fields.
D. L. Smith, and J. W. Meadows. Jun 75, 44p
Contract W-31-109-Eng-38

Descriptors: (*Aluminium 27, *Neutron reactions), (*Titanium 46, Neutron reactions), (*Titanium 47, Neutron reactions), (*Titanium 48, Neutron reactions), Cross sections, Charge-exchange reactions, Cobalt 59, Iron 54, Iron 56, Nickel 58, Zinc 64, Fission, Uranium 238, Californium 252, Spontaneous fission, Thermal neutrons, Uranium 235.

For abstract, see NSA 32 08, number 21127.

ANU-P-611 PC$4.00/MF$2.25
Australian National Univ., Canberra. Dept. of Nuclear Physics.
Programs for Nuclear Data Analysis.
R. A. I. Bell. Jan 75, 16p
U.S. Sales Only.

Descriptors: (*Nuclear reactions, *Computer codes), Data, Data processing.

For abstract, see NSA 32 08, number 21049.

ANU-P-614 PC$5.75/MF$2.25
Australian National Univ., Canberra. Research School of Physical Sciences.
Analysis of E1 and E2 Radiative alpha -Capture and Giant Multipole Resonances.
N. Shikazono, and T. Terasawa. Apr 75, 54p
U.S. Sales Only.

Descriptors: (*Silicon 28, Alpha reactions), (*Argon 36, Alpha reactions), (*Magnesium 24, Alpha reactions), (*Alpha reactions, *Capture), Compound-nucleus reactions, Cross sections, Energy-level transitions, Excitation functions, Four-nucleon transfer reactions, Gamma radiation, Giant resonance, Level widths, Optical models, Spectroscopic factors, Calcium 40, Sulfur 32.

For abstract, see NSA 32 08, number 21128.

BNL-20087 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Masses of T/sub Z/ = +5/2 Nuclei in the S--D Shell from beta --Decay Measurements.
D. E. Alburger, D. R. Goosman, C. N. Davids, and J. C. Hardy. 1975, 9p CONF-750648-1

Descriptors: (*Light nuclei, *Mass), (*Mass formulae, *Accuracy), (*Silicon 33, *Mass defect), Shell models.

For abstract, see NSA 32 08, number 21129.

CALT-63-229 PC$4.50/MF$2.25
California Inst. of Tech., Pasadena.
Research in Nuclear Physics at Low and Intermediate Energies, and X Rays. Budget Proposal and Progress Report, 1 October 1975--30 September 1976.
F. Boehm. 7 May 75, 29p
Contract AT(04-3)-63

Descriptors: (*Nuclear physics, *Research programs), (*Pionic atoms, Research programs), (*Muonic atoms, Research programs), Atoms, Hadronic atoms, X radiation.

For abstract, see NSA 32 08, number 21050.

CEA-CONF-3006 PC$4.00/MF$2.25
CEA Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
Deformation Effects in Neutron Scattering from the SM Isotopes.
M. T. McEllistrem, J. Lachkar, G. Haouat, C. Lagrange, and Y. Patin. 1975, 4p CONF-750303-68
U.S. Sales Only.

Descriptors: (*Samarium 148, *Neutron reactions), (*Samarium 150, Neutron reactions), (*Samarium 152, Neutron reactions), (*Samarium 154, Neutron reactions), Coupled channel theory, Cross sections, Deformed nuclei, Differential cross sections, Elastic scattering, Inelastic scattering, Mev range 01-10, Neodymium 146, Neutrons, Nuclear deformation, Optical models.

For abstract, see NSA 32 08, number 21193.

CEA-CONF-3009 PC$4.00/MF$2.25
Montreal Univ., Quebec (Canada).
Bhf-Plus-Rearrangement Calculations with Soft-Core Forces in exp 16 O.
R. Padjen, B. Rouben, D. Gogny, and P. Pires. 1975, 2p CONF-750233-1
In French. U.S. Sales Only.

Descriptors: (*Oxygen 16, *Nuclear structure), Brueckner method, G matrix, Hartree-fock method, Soft-core potential.

For abstract, see NSA 32 08, number 21088.

CEA-CONF-3012 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. de Physique Nucleaire.
(Exp 16 O, exp 14 C) Two Proton Transfer Reaction Induced Two Step Processes in the Germanium Target Isotopes.
M. Cobern, M. C. Lemaire, K. S. Low, M. C. Mermaz, and H. Sztark. 1975, 2p CONF-750118-4
U.S. Sales Only.

Descriptors: (*Germanium 72, Oxygen 16 reactions), (*Germanium 74, Oxygen 16 reactions), (*Germanium 76, Oxygen 16 reactions), (*Oxygen 16 reactions, *Stripping), Angular distribution, Carbon 14, Coupled channel theory, Cross sections, Mev range 10-100, Nuclear cores, Optical models, Two-nucleon transfer reactions.

For abstract, see NSA 32 08, number 21178.

CEA-CONF-3038 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. de Physique Nucleaire.
Exp 4 He(Gamma ,p)T Reaction and Ground State Baryonic Resonance Admixtures.
J. M. Laget. 1975, 2p CONF-750222-4
U.S. Sales Only.

Descriptors: (*Helium 4, *Photonuclear reactions), Cross sections, Diagrams, Ground states, Mev range 100-1000, Protons, Resonance, Tritium.

For abstract, see NSA 32 08, number 21076.

CEA-CONF-3057 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. de Physique Nucleaire.
Total Cross Section and the Fission Cross Section of exp 241 AM in the Resonance Region: Resonance Parameters.
H. Derrien, and B. Lucas. 1975, 5p CONF-750303-69
U.S. Sales Only.

Descriptors: (*Americium 241, Neutron reactions), (*Neutron reactions, *Fission), Energy levels, Level widths, Pulsed neutron techniques, Resonance, Strength functions, Total cross sections.

For abstract, see NSA 32 08, number 21260.

CEA-R-4641 PC$6.00/MF$2.25
CEA Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
Differential Cross Sections for Carbon Neutron Elastic and Inelastic Scattering from 8.0 to 14.5 Mev.
G. Haouat, J. Lachkar, J. Sigaud, Y. Patin, and F. Cocu. Feb 75, 56p
In French. U.S. Sales Only.

Descriptors: (*Carbon, Neutron reactions), (*Neutron reactions, *Elastic scattering), Angular distribution, Differential cross sections, Excitation functions, Fast neutrons, Inelastic scattering, Mev range 01-10, Mev range 10-100.

For abstract, see NSA 32 08, number 21089.

COM-75-11366/2GA PC$4.75/MF$2.25
National Bureau of Standards, Washington, D.C. Center for Radiation Research.
Interactions of High Energy Particles with Nuclei.
Final rept.,
Wieslaw Czyz. Sep 75, 76p NBS-Mono-139
Library of Congress Catalog Card no. 74-13725.

Descriptors: *Elementary particle interactions, Nuclei(Nuclear physics), Elastic scattering, Photons, Neutrinos, Schrodinger equation, Wave equations.
Identifiers: Hadrons.

Elastic scattering and diffractive production processes induced in nuclear targets by high energy projectiles are discussed in this article. Special attention is paid to the interaction of high energy hadrons and photons. Interactions of high energy electrons and neutrinos are briefly mentioned. The common features of all these processes are emphasized throughout the article: The multiple scattering and shadowing processes inside of the target nuclei. An effort is made to develop a unified way of treating nuclear interactions of particles which are either hadrons or exhibit some hadronic components in such interactions. This article is divided into five sections: (1) Introduction, (2) Description of multiple scattering, (3) Elastic scattering of hadrons from nuclei, (4) Diffractive dissociation and diffractive excitation, (5) Diffractive production of hadrons in hadron-nucleon collisions.

CONF-750307-10 PC$4.00/MF$2.25
California Inst. of Tech., Pasadena.
Neutrino Interactions with Two Muons in the Final State.
B. C. Barish, J. F. Bartlett, and A. Bodek. 9 Apr 75, 12p
Contract AT(11-1)-68

Descriptors: (*Muons plus, *Pair production), (*Muons minus, Pair production), (*Neutrino-nucleon interactions, Pair production), Hadrons.

For abstract, see NSA 32 08, number 20903.

CONF-750649-1 PC$5.75/MF$2.25
Argonne National Lab., Ill.
Acceleration of Polarized Protons to Multi-Gev Energies and Experiments with Polarized Protons from 2 to 6 Gev/C.
L. G. Ratner. 1975, 51p

Descriptors: (*Zgs, *Polarized beams), (*Proton-proton interactions, *Elastic scattering), Delta-1236 resonances, Depolarization, Gev range 01-10, Lambda particles, Linear momentum, N*resonances, P invariance, Particle production, Polarization, Proton beams, Total cross sections.

For abstract, see NSA 32 08, number 20904.

COO-1195-339 PC$4.00/MF$2.25
Fermi National Accelerator Lab., Batavia, Ill.
Hadron Production at 0.8 Mrad by 300 Gev Protons Incident on a Thick Aluminum Target.
B. Aubert, A. Benvenuti, and D. Cline. Apr 75, 3p CONF-750307-8

Descriptors: (*Pions plus, *Particle production), (*Kaons plus, Particle production), (*Antiprotons, Particle production), (*Pions minus, Particle production), Aluminium 27, Gev range 100-1000, Kaons minus, Proton reactions.

For abstract, see NSA 32 08, number 20905.

COO-1195-340 PC$4.00/MF$2.25
Illinois Univ., Urbana Dept. of Physics.
Photoproduction at Fnal.
A. Wattenberg. May 75, 13p CONF-750547-6

Descriptors: (*Psi-3105 resonances, *Photoproduction), (*Hadron-hadron interactions, *Total cross sections), (*Beryllium 9, *Photonuclear reactions), Antilambda particles, Cross sections, Lambda particles, Missing mass, Muons minus, Muons plus, Pair production.

For abstract, see NSA 32 08, number 20895.

COO-1195-341 PC$4.00/MF$2.25
Illinois Univ., Urbana.
High Energy Photoproduction of New Massive Particles.
T. O'Halloran, J. Sarracino, and A. Wattenberg. May 75, 14p CONF-750654-4

Descriptors: (*Psi-3105 resonances, *Leptonic decay), (*Beryllium 9, *Photonuclear reactions), Cross sections, Electron pairs, Gev range 100-1000, Magnetic spectrometers, Mass spectra, Multiwire proportional chambers, Muons minus, Muons plus, Photoproduction, Scintillation counters.

For abstract, see NSA 32 08, number 20896.

COO-1195-342 PC$4.00/MF$2.25
Illinois Univ., Urbana.
Dimuon Production by High Energy Neutrons.
R. Messner, T. O'Halloran, and A. Wattenberg. May 75, 11p CONF-750654-5

Descriptors: (*Beryllium 9, Neutron reactions), (*Neutron reactions, *Pair production), Cross sections, Gev range 100-1000, Longitudinal momentum, Magnetic spectrometers, Mass, Muons minus, Muons plus, Reaction kinetics, Scintillation counters, Transverse momentum.

For abstract, see NSA 32 08, number 21090.

COO-1195-343 PC$4.00/MF$2.25
Illinois Univ., Urbana Dept. of Physics.
Possible Broad 3 pi Resonance Near 1900 Mev/C Coupling to N Anti delta .
D. S. Rhines. May 75, 4p CONF-750547-5

Descriptors: (*Pion-proton interactions, *Mass spectra), (*Meson resonances, *Mass), Gev range 01-10, Linear momentum, Particle widths, Pions minus, Pions plus, Protons.

For abstract, see NSA 32 08, number 20914.

COO-2130-163 PC$24.00/MF$2.25
Kansas State Univ., Manhattan.
Heavy Ion Lecture Series, 1972--73, Volume II.
J. D. Spangler, and G. G. Seaman. 1973, 417p

Descriptors: (*Heavy ions, *Lectures), (*Heavy ion reactions, Lectures), Leading abstract.

For abstract, see NSA 32 08, number 21131.

COO-2171-45 PC$5.00/MF$2.25
Rochester Univ., N.Y. Dept. of Physics and Astronomy.
Theoretical Predictions for alpha Particle Spectroscopic Strengths.
J. P. Draayer. 12 May 75, 38p
Contract E(11-1)-2171

Descriptors: (*Magnesium 24, Lithium 6 reactions), (*Neon 21, Lithium 6 reactions), (*Light nuclei, Lithium 6 reactions), (*Lithium 6 reactions, *Stripping), Alpha-transfer reactions, Cluster model, Deuterons, Dwba, Rotational states, Spectroscopic factors, Strength functions, Su-3 groups, Su-4 groups, Symmetry, Magnesium, Silicon 28.

For abstract, see NSA 32 08, number 21134.

COO-2171-53 PC$4.00/MF$2.25
Rochester Univ., N.Y. Dept. of Physics and Astronomy.
Nuclear Structure Theory. Annual Technical Progress Report, 1 July 1974--30 June 1975.
J. B. French, and D. S. Koltun. 1975, 12p
Contract AT(11-1)-2171

Descriptors: (*Nuclear structure, *Research programs), Beta decay, Bremsstrahlung, Energy levels, Giant resonance, Meson-nucleon interactions, Nuclear theory, Scattering, Spectroscopy, Strength functions, Sum rules, Symmetry, Three-body problem.

For abstract, see NSA 32 08, number 21300.

COO-2176-34 PC$4.00/MF$2.25
Columbia Univ., New York.
Level Density Calculation for Deformed Nuclei.
J. P. Felvinci, D. Cacuci, and E. Melkonian. 1975, 3p CONF-750303-73

Descriptors: (*Samarium 153, *Vibrational states), (*Gadolinium 155, Vibrational states), (*Gadolinium 159, Vibrational states), (*Erbium 165, Vibrational states), Compound nuclei, Deformed nuclei, Energy-level density, Erbium 167, Erbium 169, Ericson theory, Neutron reactions, Plutonium 241, Thorium 233, Tungsten 183, Tungsten 185, Uranium 235, Uranium 237, Uranium 239, Ytterbium 173.

For abstract, see NSA 32 08, number 21228.

COO-2176-35 PC$4.00/MF$2.25
Columbia Univ., New York.
Quantum Numbers of Low Lying Neutron Resonances in U-235.
J. P. Felvinci, E. Melkonian, and W. W. Havens, Jr.. 1975, 4p CONF-750303-72

Descriptors: (*Uranium 235, *Energy levels), (*Neutron reactions, *Fission), Compound nuclei, Cross sections, Fission fragments, Resonance, Spin.

For abstract, see NSA 32 08, number 21262.

COO-2176-36 PC$4.00/MF$2.25
Columbia Univ., New York.
Evidence for Structure in the Sequence of S-Wave Levels in exp 238 U.
E. Melkonian, J. P. Felvinci, and W. W. Havens, Jr.. 1975, 2p CONF-750303-71

Descriptors: (*Uranium 238, *Vibrational states), Collective excitations, Collective model, Correlations, Level widths, Neutron reactions, S waves.

For abstract, see NSA 32 08, number 21263.

COO-2232A-23 PC$4.00/MF$2.25
Rockefeller Univ., New York.
High Energy Pd Implies Xd Diffraction Dissociation: Comparison to Pp Implies Xp and Analysis.
K. Goulianos. 1975, 15p CONF-750654-2
Contract E(11-1)-2232A

Descriptors: (*Proton-proton interactions, *Cross sections), Diffraction models, Factorization, Gev range 100-1000, Inclusive interactions, Linear momentum, Proton-deuteron interactions, Protons, Regge poles, Sum rules.

For abstract, see NSA 32 08, number 20995.

COO-2479-5 PC$4.00/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y.
Precision Neutron Cross Section Measurements in Support of the Lmfbr Program. Annual Progress Report, 1 July 1974--30 June 1975.
R. C. Block, and R. W. Hockenbury. Apr 75, 7p
Contract AT(11-1)-2479

Descriptors: (*Lmfbr type reactors, *Research programs), Capture, Cross sections, Neodymium 145, Ruthenium 101, Ruthenium 102, Ruthenium 104, Samarium 149, Uranium 238.

For abstract, see NSA 32 08, number 21264.

COO-3001-119 PC$4.00/MF$2.25
State Univ. of New York, Stony Brook.
Abnormal States of Nuclear Matter.
L. Castillejo. 1975, 13p CONF-750631-11
Contract AT(11-1)-3001

Descriptors: (*Nuclear matter, *Sigma model), Chiral symmetry, Correlations, Pions minus, Reviews, Symmetry breaking, Vacuum states.

For abstract, see NSA 32 08, number 21301.

COO-3058-63 PC$4.75/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y. Div. of Nuclear Engineering.
Application of Interactive Graphics and Continuous Slowing down Theory to the Assessment of Nuclear Data Files.
M. Danchak, M. Becker, and W. R. Moyer. 1972, 33p
Contract AT(11-1)-3058

Descriptors: (*Neutron spectra, *Computer calculations), (*Neutron slowing-down theory, Computer calculations), (*Depleted uranium, Neutron spectra), (*Iron, Neutron spectra), Computer codes, Cross sections, Interactive display devices, Neutron flux, Nuclear data collections, Slowing-down.

For abstract, see NSA 32 08, number 21058.

COO-3075-70 PC$4.50/MF$2.25
Yale Univ., New Haven, Conn. Dept. of Physics.
Color Quarks and Octonions.
F. Guersey. 1974, 29p CONF-740135-2
Contract AT(11-1)-3075

Descriptors: (*Su-6 groups, *Hadrons), Color model, Hilbert space, Quark model, Su-3 groups.

For abstract, see NSA 32 08, number 20954.

COO-3130-TB-188 PC$5.75/MF$2.25
Brown Univ., Providence, R.I. Dept. of Physics.
Radiative Corrections to Expt. 416. Backward pi N Charge Exchange. Internal Report No. 131.
G. T. Y. Chen. 54p
Contract AT(11-1)-3130

Descriptors: (*Pion-proton interactions, *Charge-exchange interactions), (*Computer codes, *D codes), Neutrons, Photons, Pions minus, Pions neutral, R codes, Radiative corrections, Schwinger terms, Unitarity.

For abstract, see NSA 32 08, number 20984.

COO-3130TA-321 PC$4.00/MF$2.25
Brown Univ., Providence, R.I. Dept. of Physics.
Comments and Critique of the omega Anti omega Model for the New Resonances.
D. M. Tow. 1975, 11p CONF-750547-9
Contract E(11-1)-3130

Descriptors: (*Psi-3105 resonances, *Particle widths), (*Psi-3695 resonances, Particle widths), (*Meson resonances, *Particle models), (*Omega particles, *Bound state), Antiomega particles, Reviews.

For abstract, see NSA 32 08, number 20965.

COO-3130TA-322 PC$4.00/MF$2.25
Brown Univ., Providence, R.I. Dept. of Physics.
Progress Report for a Research Program in Theoretical High-Energy Physics.
D. Feldman. 1 Jun 75, 9p

Descriptors: (*High energy physics, *Research programs), Bound state, Charge-exchange interactions, Charm particles, Composite models, Cross sections, Decay, Dimensions, Distribution, Eikonal approximation, Elastic scattering, Electromagnetic interactions, Excitation, Field theories, Functionals, Gauge invariance, General relativity theory, Hadrons, Inelastic scattering, Lifetime, Many-body problem, Multiperipheral model, Multiple production, Multiplicity, Neutral currents, Neutrino-nucleon interactions, Particle models, Particle widths, Phase transformations, Pions, Psi-3105 resonances, Psi-3695 resonances, Quarks, Resonance particles, Scalars, Scattering amplitudes, Semiclassical approximation, Spin, Strong interactions, Symmetry breaking, Total cross sections, Weak interactions.

For abstract, see NSA 32 08, number 20883.

COO-3130TB-214 PC$6.00/MF$2.25
Brown Univ., Providence, R.I.
Progress Report of a Research Program in Experimental High Energy Physics, 1 September 1974--31 August 1975.
A. M. Shapiro, and R. E. Lanou, Jr.. 1975, 59p
Contract E(11-1)-3130

Descriptors: (*Hadron-hadron interactions, *Research programs), Baryon-exchange models, Bubble chambers, Charged particles, Correlations, Cross sections, Diffraction models, Distribution, Elastic scattering, Energy, Exchange interactions, Gev range 01-10, Hadrons, High energy physics, Inclusive interactions, Linear momentum, Mass, Mass spectra, Meson-nucleon interactions, Multiple production, Multiplicity, Nucleon-nucleon interactions, Ope model, Pion-proton interactions, Pions minus, Pions plus, Pomeranchuk particles, Proton-antiproton interactions, Proton-proton interactions, Quantum numbers, Quasi-elastic scattering, Reaction kinetics, Spark chambers, Strange particles, Strong interactions, Total cross sections.

For abstract, see NSA 32 08, number 20906.

COO-3230-4 PC$4.00/MF$2.25
Brandeis Univ., Waltham, Mass. Dept. of Physics.
Research in Elementary Particle Physics. Technical Progress Report, 1 September 1974--29 May 1975.
L. E. Kirsch, and H. J. Schnitzer. 1975, 15p
Contract E(11-1)-3230

Descriptors: (*Hadron-hadron interactions, *Research programs).

For abstract, see NSA 32 08, number 20907.

COO-3239-12 PC$6.00/MF$2.25
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Chemistry.
Nuclear Chemistry Research of High Energy Nuclear Reactions at Carnegie-Mellon University. Progress Report, 1974--1975.
A. A. Caretto, Jr.. May 75, 60p

Descriptors: (*Nuclear chemistry, *Research programs), (*Nuclear reactions, Research programs), Cross sections, Nuclear physics, Pennsylvania.

For abstract, see NSA 32 08, number 21194.

COO-3533-54 PC$4.25/MF$2.25
Syracuse Univ., N.Y. Dept. of Physics.
Strings, Monopoles, and Meson States.
A. P. Balachandran, R. Ramachandran, J. Schechter, K. C. Wali, and H. Rupertsberger. Apr 75, 24p SU-4206-54

Descriptors: (*Quarks, *Confinement), Charm particles, Dirac equation, Magnetic monopoles, String models.

For abstract, see NSA 32 08, number 20955.

DESY-75/13 PC$4.50/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Color and the New Particles. A Brief Review.
D. Schildknecht. May 75, 26p CONF-750309-4
U.S. Sales Only.

Descriptors: (*Psi-3105 resonances, *Color model), (*Psi-3695 resonances, Color model), Decay, Omega-784 resonances, Particle widths, Phi-1019 resonances, Reviews.

For abstract, see NSA 32 08, number 20966.

DESY-75/15 PC$4.50/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Broken Su(4) Relations for Particle Production at Large Angle.
T. Inami. Jun 75, 30p
U.S. Sales Only.

Descriptors: (*Su-4 groups, *Symmetry breaking), (*Proton-proton interactions, *Differential cross sections), (*Charm particles, *Particle production), Eta mesons, Hadron-hadron interactions, Inclusive interactions, Kaons, Leptons, Pions, Su-3 groups.

For abstract, see NSA 32 08, number 20927.

EIR-217 PC$6.25/MF$2.25
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Neutron Capture Cross Section Measurements in the Energy Region from 0.01 to 10 Electron Volts.
F. Widder. Apr 75, 65p
U.S. Sales Only.

Descriptors: (*Vanadium, *Neutron reactions), (*Magnesium, Neutron reactions), (*Cesium, Neutron reactions), (*Europium, Neutron reactions), Capture, Cross sections, Dysprosium, Europium 151, Europium 153, Ev range, Ev range 01-10, Gamma radiation, Lutetium, Lutetium 175, Lutetium 176, Multiple scattering, Tantalum.

For abstract, see NSA 32 08, number 21159.

FUPH-R-118 PC$4.00/MF$2.25
Flinders Univ. of South Australia, Bedford Park. School of Physical Sciences.
Complex Separable Potential for the alpha -- Alpha Interaction.
R. T. Janus. Mar 75, 17p
U.S. Sales Only.

Descriptors: (*Alpha reactions, *Coulomb scattering), (*Helium 4, Alpha reactions), Alpha particles, Coulomb field, Energy dependence, Knock-out reactions, Mev range 10-100, Nonlocal potential, Nuclear potential, Phase shift, S matrix.

For abstract, see NSA 32 08, number 21078.

HASL-293 PC$4.00/MF$2.25
Energy Research and Development Administration, New York Health and Safety Lab.
Total Neutron Cross Sections from 15 Mev to 25.5 Gev for Isotopes with Mass Numbers, 12 Less Than or Equal to a Less Than or Equal to 64.
R. S. Sanna. Apr 75, 22p

Descriptors: (*Carbon 12, *Neutron reactions), (*Aluminium 27, Neutron reactions), (*Copper 64, Neutron reactions), (*Nitrogen 14, Neutron reactions), Intermediate mass nuclei, Light nuclei, Nuclear data collections, Total cross sections.

For abstract, see NSA 32 08, number 21093.

HEDL-TME-72-90 PC$10.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Lmfbr Reaction Rate and Dosimetry 4TH Quarterly Progress Report, March, April, May 1972.
W. N. McElroy. Jun 72, 140p
Contract AT(45-1)-2170

Descriptors: (*Lmfbr type reactors, *Dosimetry), Leading abstract, Nuclear reaction kinetics, Research programs.

For abstract, see NSA 3208

HU-TFT-75-2 PC$4.00/MF$2.25
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Radial Expansion in the Hydrodynamic Model for Particle Production in 1, 2, and 3 Dimensions.
S. Sohlo, and G. Wilk. Jan 75, 12p
U.S. Sales Only.

Descriptors: (*Hydrodynamic model, *Particle production), (*Bootstrap model, *Hadrons), (*Electron-positron interactions, *Annihilation), (*Proton-proton interactions, *Kinetics), Analytical solution, Hadron reactions, Hadron-hadron interactions, One-dimensional calculations, Series expansion, Sound waves, Three-dimensional calculations, Transverse momentum, Two-dimensional calculations, Velocity.

For abstract, see NSA 32 08, number 20957.

HU-TFT-75-3 PC$4.50/MF$2.25
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Strong and Electromagnetic Widths of psi(3105) in a Broken Su(4) Scheme.
K. Kajantie, C. Montonen, M. Roos, and N. Toernqvist. Jan 75, 28p
U.S. Sales Only.

Descriptors: (*Psi-3105 resonances, *Decay), (*Phi-1019 resonances, Decay), (*Psi-3695 resonances, Decay), (*Meson resonances, Decay), Charm particles, D-1285 resonances, Electromagnetic interactions, Mass, Missing mass, Mixing ratio, Multiplets, Parity, Particle decay, Particle widths, Pseudoscalar mesons, Quark model, Quarks, Spin, Strong interactions, Su-4 groups, Symmetry breaking, Vector mesons.

For abstract, see NSA 32 08, number 20967.

HU-TFT-75-8 PC$5.25/MF$2.25
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Saturating Effect of the delta (1236) in Nuclear Matter.
A. M. Green, and J. A. Niskanen. Mar 75, 41p
U.S. Sales Only.

Descriptors: (*Delta-1236 resonances, *Saturation), (*Nuclear matter, Delta-1236 resonances), Binding energy, Brueckner method, Nucleon-nucleon interactions, Reid potential, Soft-core potential, Three-body problem, Variational methods.

For abstract, see NSA 32 08, number 21303.

IEA-366 PC$4.00/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
Angular Distribution of Photofission Fragments in exp 238 U at 5.43 Mev.
S. Kuniyoshi, O. Y. Mafra, C. Renner, and J. Goldemberg. Dec 74, 12p
U.S. Sales Only.

Descriptors: (*Uranium 238, *Energy levels), (*Photonuclear reactions, *Photofission), (*Fission fragments, *Angular distribution), Deformed nuclei, Gamma radiation, Mev range 01-10.

For abstract, see NSA 32 08, number 21278.

IS-T-673 PC$10.50/MF$2.25
Ames Lab., Iowa.
On-Line gamma--Gamma Angular Correlation Studies of Cascades in exp 140 BA, exp 90 Sr, and exp 140 CS.
L. J. Alquist. May 75, 148p
Contract W-7405-eng-82

Descriptors: (*Barium 140, *Energy-level transitions), (*Strontium 90, Energy-level transitions), (*Cesium 140, Energy-level transitions), Fission yield, Uranium 235, Angular correlation, Mixing ratio, Multipolarity, Spin, Beta-minus decay, Krypton 90, Rubidium 90, Xenon 140.

For abstract, see NSA 32 08, number 21198.

JINR-D1-8859 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Charge Distributions in pi exp - p and pi exp - N Interactions at 40 Gev/C.
E. N. Kladnitskaya, N. N. Mel'nikova, A. Mihul, V. M. Shekhter, and L. M. Shcheglova. 1975, 30p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Charge distribution), (*Pion-neutron interactions, Charge distribution), Multiperipheral model, Quark model.

For abstract, see NSA 32 08, number 20915.

JINR-E1-8794 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Strangeness Exchange in High-Energy Interactions.
A. Mihul, and T. Angelescu. 1975, 13p
U.S. Sales Only.

Descriptors: (*Kaon-proton interactions, *Strangeness), Exchange interactions, Gev range 01-10, Gev range 10-100, Kaons minus, Kaons plus, Linear momentum.

For abstract, see NSA 32 08, number 20985.

JINR-E2-8708 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Some Remarks on psi Particles.
S. M. Bilen'kii, and B. M. Pontekorvo. 1975, 11p
U.S. Sales Only.

Descriptors: (*Psi-3105 resonances, *Decay), (*Psi-3695 resonances, Decay), Antineutrinos, Neutrinos, Weak interactions.

For abstract, see NSA 32 08, number 20970.

JINR-E2-8857 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Asymptotic Behaviour of Form Factor and Invariant Description of Particle Spatial Distribution.
N. B. Skachkov. 1975, 28p
U.S. Sales Only.

Descriptors: (*Protons, *Form factors), Boundary conditions, Breit-wigner formula, Configuration mixing, Coordinates, Dipoles, Distribution, Lorentz groups, Mathematical space, Series expansion, Spatial distribution, Spin, Unitary symmetry, Vectors.

For abstract, see NSA 32 08, number 20986.

JINR-E2-8869 PC$5.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Low-Energy Physics of Mesons in the Quantum Chiral Theory.
M. K. Volkov. 1975, 47p
U.S. Sales Only.

Descriptors: (*Kaons, *Electromagnetic interactions), (*Pions, Electromagnetic interactions), Chirality, Mesons, Quantum field theory, Strong interactions, Weak interactions.

For abstract, see NSA 32 08, number 20936.

JINR-E2-8896 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Relativistic Fourier Analysis, Quasipotential Approach and Proton--Proton Elastic Scattering.
S. Shch. Mavrodiev, and R. Karadzhov. 1975, 20p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Elastic scattering), Coordinates, Fourier analysis, Mathematical space, Relativistic range, Scattering amplitudes.

For abstract, see NSA 32 08, number 20996.

JINR-E4-8847 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Fragmentation of Single-Particle States and Neutron Strength Functions.
V. G. Soloviev. 1975, 17p CONF-750555-1
U.S. Sales Only.

Descriptors: (*Even-odd nuclei, *Energy levels), (*Deformed nuclei, Energy levels), (*Uranium 239, Energy levels), (*Erbium 169, Energy levels), Fragmentation, S waves, Single-particle model, Strength functions, P waves, Phonons, Quasi particles, Erbium 168, Neutron reactions, Spherical model, Tin isotopes, Uranium 238.

For abstract, see NSA 32 08, number 21310.

JINR-P1-8718 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Study of Partial Inelasticity Coefficients in pi exp - p, pi exp - N, and pi exp - C exp 12 -Interactions at 40 Gev/C.
N. S. Angelov, V. G. Grishin, and L. A. Didenko. 1975, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Reaction kinetics), (*Pion-neutron interactions, Reaction kinetics), (*Carbon 12, *Pion reactions), Gev range 10-100, Linear momentum, Pions minus, Pions neutral.

For abstract, see NSA 32 08, number 20916.

JINR-P1-8719 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Scaling of Topological Cross Sections Relative to the Longitudinal and Transverse Momenta.
N. Angelov, N. O. Akhababyan, L. D. Grekova, N. N. Mel'nikova, and V. N. Penev. 1975, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Cross sections), (*Proton-proton interactions, Cross sections), Longitudinal momentum, Mesons, Multiple production, Pions minus, Scaling laws, Spectra, Transverse momentum.

For abstract, see NSA 32 08, number 20987.

JINR-P1-8758 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Determination of the Real Part of the Forward Pp and Anti Pp Scattering Amplitude and of

the Differential Cross Section Slope Using the Costheta Plane Analyticity.
O. Dumbrais, Z. Elatanov, and Kh. Chernev. 1975, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Elastic scattering), (*Proton-antiproton interactions, *Scattering amplitudes), Boundary conditions, Differential cross sections, Interference.

For abstract, see NSA 32 08, number 20971.

JINR-P1-8848 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Analysis of Semi-Inclusive One-Particle Distributions in pi exp - p Interactions at p = 40 Gev/C.
L. N. Abesalashvili, N. S. Amaglobeli, and V. G. Grishin. 1975, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Pions minus, *Particle production), (*Pions plus, Particle production), (*Pion-proton interactions, *Diffraction models), Energy spectra.

For abstract, see NSA 32 08, number 20917.

JINR-P2-8815 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Isotopic Invariance and Relations Between the Cross Section of Reactions with the Multiparticle Production.
Kh. M. Beshtoev, and A. N. Sisakyan. 1975, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Hadrons, Multiple production), (*Multiple production, *Cross sections), Invariance principles, Su-2 groups.

For abstract, see NSA 32 08, number 20928.

JINR-P2-8872 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Pi D Scattering Problem in the Framework of Three-Particle Relativistic Equations.
T. I. Kopaleishvili, and A. I. Machavariani. 1975, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-deuteron interactions, *Charge-exchange interactions), Angular momentum, Cross sections, Elastic scattering, Integral equations, Isospin, Matrices, Nucleons, One-dimensional calculations, Pairing interactions, Potential scattering, Relativistic range.

For abstract, see NSA 32 08, number 20997.

JINR-P2-8878 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Partially Coherent Hadron Production.
V. M. Mal'tsev, and S. I. Sinegovskii. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Hadrons, *Coherent production), Correlations, Multiple production, Particle production, S matrix.

For abstract, see NSA 32 08, number 20958.

JINR-P2-8880 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Calculation of the Differential and Total Cross Sections in the Glauber Approximation.
S. M. Eliseev. 1975, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Particle interactions, *Differential cross sections), Computer codes, Fortran, Glauber theory, Nuclei, Total cross sections, Wave functions.

For abstract, see NSA 32 08, number 20923.

JINR-P2-8897 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Model for High Energy Hadron Scattering.
S. Shch. Mavrodiev. 1975, 23p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Elastic scattering), Born approximation, Coordinates, Fourier analysis, Geometry, Hadron-hadron interactions, Mathematical space, Scale invariance.

For abstract, see NSA 32 08, number 20959.

JINR-P4-8837 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Scattering of Slow pi Mesons on Nuclei.
D. A. Arsen'ev, and G. G. Bunatyan. 1975, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Carbon 12, *Pion reactions), (*Aluminium 27, Pion reactions), (*Oxygen 16, Pion reactions), (*Copper 64, Pion reactions), Differential cross sections, Elastic scattering, Lead 208, Mev range 10-100, Mev range 100-1000, Nuclear potential, Pions.

For abstract, see NSA 32 08, number 21096.

JINR-P6-8823 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Correlations of Directions of gamma -Radiation in exp 153 Gd.
B. A. Alikov, M. Budzynski, and T. Bedike. 1975, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Terbium 153, *Electron capture decay), (*Gadolinium 153, *Energy levels), Angular correlation, Gamma radiation, Gamma spectra, Energy-level transitions, Multipolarity, Parity, Spin.

For abstract, see NSA 32 08, number 21229.

KFK-2118 PC$7.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Neutronenphysik und Reaktortechnik.
D3d: A Fortran Program for Solving the Three-Dimensional Stationary Multigroup Diffusion Equations.
B. Stehle. Mar 75, 90p
In German. U.S. Sales Only.

Descriptors: (*Multigroup theory, Computer codes), (*Computer codes, *D codes), (*Neutron transport theory, Computer codes), Computer calculations, Eigenvalues, Fission spectra, Fortran, Three-dimensional calculations.

For abstract, see NSA 32 08, number 21062.

LA-UR-75-1265 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Parity Nonconservation in Two-Nucleon Systems.
D. E. Nagle. 1975, 8p CONF-750631-6
Contract W-7405-eng-36

Descriptors: (*Proton-nucleon interactions, *P invariance), (*Hydrogen 1, *Proton reactions), Lamb shift, Polarized beams, Weak interactions, Mev range 10-100, Scattering, Beryllium 9, Gev range 01-10, Water.

For abstract, see NSA 32 08, number 21079.

LA-UR-75-1274 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Low Energy Pion--Nucleon and Pion--Deuteron Interactions.
R. L. Burman. 1975, 12p CONF-750631-7
Contract W-7405-eng-36

Descriptors: (*Hydrogen 1, Pion reactions), (*Deuterium, Pion reactions), (*Pion reactions, *Inelastic scattering), Mev range 100-1000, Pions plus, Bremsstrahlung, Elastic scattering, Pions minus, Absorption, Breakup reactions, Neutrons, Protons.

For abstract, see NSA 32 08, number 21080.

LA-UR-75-1281 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Implications of Parity Violating Effects in Strangeness Conserving Nonleptonic Processes.
P. Herczeg. 1975, CONF-750631-8
Contract W-7405-eng-36

Descriptors: (*Nuclear reactions, *P invariance), Algebraic currents, Electromagnetic interactions, Energy-level transitions, Exchange interactions, Strong interactions.

For abstract, see NSA 32 08, number 21018.

LA-5952 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Method of Characteristics for the Transport Equation Solution.
B. G. Carlson. Jul 75, 30p

Descriptors: (*Neutron transport theory, *Multigroup theory), Discrete ordinates, Numerical solution, Quadratures.

For abstract, see NSA 32 08, number 21063.

LBL-3633 PC$13.50/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Single Particle Inclusive Spectra Resulting from the Collision of Relativistic Protons, Deuterons, alpha Particles, and Carbon Ions with Nuclei.
J. Papp. May 75, 207p
Contract W-7405-ENG-48

Descriptors: (*Pions plus, *Nuclear reaction yield), (*Pions minus, Nuclear reaction yield), (*Protons, Nuclear reaction yield), (*Deuterons, Nuclear reaction yield), Alpha reactions, Beryllium 9, Carbon, Carbon 12 reactions, Copper, Cross sections, Deuteron reactions, Helium 3, Helium 4, Inclusive interactions, Lead, Limiting fragmentation, Particle production, Proton reactions, Relativistic range, Spectra, Tritium.

For abstract, see NSA 32 08, number 21097.

LBL-3636 PC$8.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
An Experimental Study of the Reaction p + D Implies exp 3 He + pi exp 0 in the delta (1236) Resonance Region.
D. H. Fredrickson. Aug 74, 99p
Contract W-7405-ENG-48

Descriptors: (*Proton-deuteron interactions, *Differential cross sections), Angular distribution, Decay, Helium 3, Invariance principles, Isospin, Linear momentum, Mev range 100-1000, Nucleons, Ope model, Photons, Pions neutral.

For abstract, see NSA 32 08, number 20908.

LBL-3810 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Search for Ericson Fluctuations in pi exp + p Scattering at 3.7 and 7.1 Gev/C.
W. Michael, and G. Gidal. Jul 75, 13p CONF-750723-11
Contract W-7405-ENG-48

Descriptors: (*Pion-proton interactions, *Elastic scattering), Asymmetry, Bubble chambers, Correlations, Differential cross sections, Ericson theory, Gev range 01-10, Linear momentum, Pions plus, T channel, U channel.

For abstract, see NSA 32 08, number 20988.

LBL-3859 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Pion Production in Nucleus--Nucleus Collisions.
L. S. Schroeder. Jun 75, 11p CONF-750631-12
Contract W-7405-ENG-48

Descriptors: (*Pions plus, *Particle production), (*Pions minus, Particle production), Charge distribution, Cross sections, Gev range 01-10, Heavy ion reactions, Nuclear reactions, Reviews.

For abstract, see NSA 32 08, number 20909.

LBL-4203 PC$4.50/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Fragmentation of Relativistic Nuclei.
B. Cork. Jun 75, 29p CONF-750655-1
Contract W-7405-eng-48

Descriptors: (*Nuclear reactions, *Fragmentation), Charge-exchange interactions, Coulomb field, Dipoles, Gev range, Giant resonance, Hadron reactions, Linear momentum, Nuclear physics, Nuclear temperature, Reviews, Shell models.

For abstract, see NSA 32 08, number 21311.

LBL-4207 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Negative Muon Spin Rotation Experiment.
T. Yamazaki, K. Nagamine, S. Nagamiya, and O. Hashimoto. Jun 75, 12p CONF-750631-9
Contract W-7405-ENG-48

Descriptors: (*Muons minus, *Spin), Actinides, Capture, Depolarization, Gyromagnetic ratio, Muonic atoms, Polarization, Precession, Relativistic range, Rotation, Strangeness.

For abstract, see NSA 32 08, number 20947.

LNF-75/3(R) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
Intermediate Nuclear Physics.
A. Malecki. Jan 75, 19p
In Italian. U.S. Sales Only.

Descriptors: (*Nuclear physics, *Reviews), (*High energy physics, Reviews), Baryon resonances, Correlations, Hadron-hadron interactions, Nuclear matter.

For abstract, see NSA 32 08, number 21052.

LUIP-CR-74-15 PC$4.00/MF$2.25
Lund Univ. (Sweden). Fysiska Institutionen.
New Interpretation of High Energy Proton--Nucleus Interaction.
B. Andersson, and I. Otterlund. Nov 74, 17p
U.S. Sales Only.

Descriptors: (*Proton-nucleon interactions, *Multiple production), Atomic number, Cascade showers, Correlations, Gev range, Glauber theory, Multiple scattering, Multiplicity, Nuclei, Relativistic range, Tev range, Woods-saxon potential.

For abstract, see NSA 32 08, number 20999.

NP-20429 PC$9.25/MF$2.25
Paris-1 Univ., 75 (France).
Ratio of the Cross Sections for the Formation of Isomeric States of /Sup 134M,F/CS, /Sup 135M,F/CS, and /Sup 84M,F/RB Produced by Reactions Induced on exp 139 la and exp 89 Y by Different Projectiles: P, D, exp 3 He, and exp 4 He.
J. C. Krupa. 18 Jun 74, 121p
In French. U.S. Sales Only.

Descriptors: (*Lanthanum 139, *Alpha reactions), (*Yttrium 89, Alpha reactions), Angular momentum, Compound nuclei, Cross sections, Deuteron reactions, Helium 3 reactions, Mev range 10-100, Mev range 100-1000, Proton reactions, Quasi-elastic scattering, Statistical models, Cesium 134, Cesium 135, Isomeric nuclei, Rubidium 84.

For abstract, see NSA 32 08, number 21199.

NP-20480(P8) PC$12.25/MF$2.25
Institute of Physical and Chemical Research, Wako, Saitama (Japan).
Ipcr Cyclotron Progress Report, 1974.
F. Ambe, M. Odera, A. Hashizume, M. Imamura, and H. Sakairi. Dec 74, 184p
U.S. Sales Only.

Descriptors: (*Radiation chemistry, *Research programs), (*Nuclear physics, Research programs), (*Radiobiology, Research programs), (*Cyclotrons, Research programs), Ion sources, Isotope production, Leading abstract, Nuclear reactions.

For abstract, see NSA 3208

ORNL-TM-4823 PC$4.75/MF$2.25
Oak Ridge National Lab., Tenn.
Production of Low Energy gamma Rays by Neutron Interactions with Fluorine for Incident Neutron Energies Between 0.1 and 20 Mev.
G. L. Morgan, and J. K. Dickens. Jun 75, 34p
Contract W-7405-eng-26

Descriptors: (*Fluorine 19, Neutron reactions), (*Neutron reactions, *Inelastic scattering), Angular distribution, Differential cross sections, Gamma radiation, Gamma spectra, Kev range 100-1000, Mev range 01-10, Mev range 10-100, Time-of-flight method, Charge-exchange reactions, Oxygen 19, Protons.

For abstract, see NSA 32 08, number 21109.

ORNL-TM-4896 PC$6.50/MF$2.25
Oak Ridge National Lab., Tenn.
Revised Light Element Library for the Origen Code.
C. W. Kee. May 75, 67p
Contract W-7405-eng-26

Descriptors: (*Light nuclei, Neutron reactions), (*Neutron reactions, *Nuclear data collections), (*Intermediate mass nuclei, Neutron reactions), (*Heavy nuclei, Neutron reactions), Activation analysis, Computer codes, Cross sections, Decay, Half-life, O codes.

For abstract, see NSA 32 08, number 21209.

ORNL-TM-4973 PC$6.00/MF$2.25
Oak Ridge National Lab., Tenn.
Au(N,X gamma) Reaction Cross Section for Incident Neutron Energies Between 0.2 and 20.0 Mev.
G. L. Morgan, and E. Newman. Aug 75, 56p
Contract W-7405-eng-26

Descriptors: (*Gold 197, *Neutron reactions), Differential cross sections, Energy dependence, Excitation functions, Fast neutrons, Gamma radiation, Gamma spectra, Kev range 100-1000, Mev range 01-10, Mev range 10-100.

For abstract, see NSA 32 08, number 21255.

ORNL-5025 PC$7.60/MF$2.25
Oak Ridge National Lab., Tenn.
Physics Division Annual Progress Report for Period Ending December 31, 1974.
May 75, 277p
Contract W-7405-eng-26

Descriptors: (*Nuclear physics, *Research programs), (*Accelerators, Research programs), (*Heavy ions, Research programs), (*Cold neutrons, Research programs), Electron spectroscopy, High energy physics, Ornl.

For abstract, see NSA 3208

ORO-3992-183 PC$6.00/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Poincare Group, Su(3) and V-a in Leptonic Decay.
A. Boehm. Jul 75, 56p
Contract AT(40-1)-3992

Descriptors: (*Leptonic decay, *Poincare groups), Cabibbo angle, Form factors, Hadrons, Pseudoscalar mesons, Su-3 groups, Symmetry breaking.

For abstract, see NSA 32 08, number 21014.

ORO-4449-6 PC$4.00/MF$2.25
Texas Agricultural and Mechanical Univ., College Station Research Foundation.
Study of the Neutron--Proton Interaction in the 300 to 700 Mev Energy Region. Annual Progress Report, 1974--1975 .
L. C. Northcliffe. 24 Jul 75, 12p
Contract AT(40-1)-4449

Descriptors: (*Proton-neutron interactions, *Research programs), Mev range 100-1000, Neutron reactions, Neutron sources, Nuclear reactions, Texas.

For abstract, see NSA 32 08, number 20910.

ORO-4856-12 PC$4.25/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Backbending in Fast Rotating Nuclei and Gapless Superconductivity I Qualitative Considerations. Technical Report No. 75-091.
A. Goswami. Jun 75, 22p

Descriptors: (*Nuclei, *Rotational states), Coriolis force, Moment of inertia, Perturbation theory, Phase transformations, Quasi particles, Random phase approximation, Rotation, Superconductivity.

For abstract, see NSA 32 08, number 21318.

ORO-4856-13 PC$5.00/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Study of (P,2P) Reaction on exp 7 Li and exp 12 C at 100 Mev. Technical Report 75-093.
R. K. Bhowmik, C. C. Chang, J. P. Didelez, and H. D. Holmgren. Jun 75, 37p

Descriptors: (*Lithium 7, Proton reactions), (*Carbon 12, Proton reactions), (*Proton reactions, *Knock-out reactions), Angular correlation, Binding energy, Boron 11, Distorted wave theory, Energy spectra, Helium 6, Impulse approximation, Linear momentum, Mev range 10-100, Optical models, Protons, S matrix, Three-body problem.

For abstract, see NSA 32 08, number 21110.

ORO-4856-14 PC$4.00/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.

Reactive Content of the Single Scattering Optical Potential.
P. C. Tandy, E. F. Redish, and D. Bolle. Jun 75, 11p

Descriptors: (*Optical models, *Knock-out reactions), (*Pickup reactions, Optical models), Amplitudes, Elastic scattering, Lippmann-schwinger equation, Nuclear potential, One-nucleon transfer reactions, Unitarity.

For abstract, see NSA 32 08, number 21319.

ORO-4856-15 PC$4.75/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Effects of Rotation on the Stability of Nuclei under Fission and the Possibility of Fusion in Heavy-Ion Reactions.
M. G. Mustafa, and K. Kumar. Jun 75, 33p

Descriptors: (*Compound nuclei, *Stability), (*Heavy ion reactions, *Fission), (*Lead 208, *Angular momentum), (*Plutonium 240, Angular momentum), Element 114, Energy levels, Fission barrier, Fusion reactions, Moment of inertia, Pairing energy, Potential energy, Rotation, Shell models.

For abstract, see NSA 32 08, number 21320.

ORO-4856-18 PC$4.00/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Variational Principle for the Bloch Unified Reaction Theory.
W. MacDonald, and R. Rapheal. 1975, 16p

Descriptors: (*Nuclear reactions, *Bloch theory), S matrix, Schroedinger equation, Variational methods.

For abstract, see NSA 32 08, number 21321.

ORO-4856-8 PC$5.75/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Invariant Potential for Elastic Pion--Nucleus Scattering. Technical Report No. 75-075.
J. B. Cammarata, and M. K. Banerjee. Apr 75, 51p

Descriptors: (*Pion-nucleon interactions, *Elastic scattering), (*Chew-low method, Pion-nucleon interactions), Carbon 12, Cross sections, Feynman diagram, Impulse approximation, Nuclear potential, Optical models, Pauli principle, Propagator, Recoils, Resonance.

For abstract, see NSA 32 08, number 20989.

RD/B/N-3233 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Evaluation of Effective Neutron Activation Cross-Section of exp 59 CO in Various Spectra.
J. P. Longworth. Apr 75, 12p
U.S. Sales Only.

Descriptors: (*Cobalt 59, Neutron reactions), (*Neutron reactions, *Capture), Activation analysis, Cobalt 60, Cross sections, Gamma radiation, Neutron flux, Nuclear reaction kinetics, Resonance, Spectra.

For abstract, see NSA 32 08, number 21186.

RT/PROT-(74)36 PC$4.25/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Results of a Comparison Between the Thermal Neutron Flux Density Standards of the C.S.N. Casaccia (Cnen) and of the p.T.B. Of Braunschweig (R.F.T.).
R. F. Laitano, and E. Rotondi. Dec 74, 23p
In Italian. U.S. Sales Only.

Descriptors: (*Neutron flux, *Calibration standards), Activation analysis, Comparative evaluations, Flux density, Thermal neutrons.

For abstract, see NSA 32 08, number 21065.

TID-26967 PC$7.25/MF$2.25
California Univ., Riverside.
Study of Photoproduction of Vector Mesons on Deuterium by 5.5 Gev Linearly Polarized Photons.
V. P. Gupta. Dec 74, 81p

Descriptors: (*Vector mesons, *Photoproduction), (*Photon-deuteron interactions, *Polarization), (*Rho-765 resonances, *Decay), (*Omega-784 resonances, *Particle production), A1-1070 resonances, Beams, Bubble chambers, Correlations, Cross sections, Density matrix, Deuterons, Distribution, Energy spectra, Exchange interactions, Gev range 01-10, Helicity, Kaons minus, Kaons plus, Linear momentum transfer, Mass, Mass spectra, Parity, Particle widths, Phi-1019 resonances, Pions minus, Pions neutral, Pions plus, Protons, Reaction kinetics, Rho-1250 resonances.

For abstract, see NSA 32 08, number 20898.

TID-26968 PC$9.75/MF$2.25
California Univ., Riverside.
Decay of a sub 20 in the Streamer Chamber.
J. T. Ozawa. Jun 75, 132p

Descriptors: (*A2-1310 resonances, *Decay), Gev range 01-10, Linear momentum, Missing mass, Neutrons, Pion-proton interactions, Pions minus.

For abstract, see NSA 32 08, number 20920.

UCID-16841 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Transactinium Nuclear Cross Section Measurements at the Lll 100-Mev Linac.
J. C. Browne. 10 Jul 75, 12p

Descriptors: (*Actinide nuclei, *Research programs), Cross sections, Fission, Lawrence livermore laboratory, Linear accelerators, Neutron reactions.

For abstract, see NSA 32 08, number 21285.

UCID-16857 PC$4.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Identification of Radioactive Nuclides Produced with Ions Accelerated by the Lll Collective-Field Accelerator.
R. J. Howerton, and J. S. Luce. 4 Aug 75, 27p
Contract W-7405-Eng-48

Descriptors: (*Intermediate mass nuclei, *Carbon 12 reactions), (*Aluminium 27, Carbon 12 reactions), (*Copper, Carbon 12 reactions), (*Molybdenum, Carbon 12 reactions), Fluorine 19 reactions, Nuclear reaction yield, Tantalum 181.

For abstract, see NSA 32 08, number 21144.

UCR-34PA107-196 PC$4.00/MF$2.25
European Organization for Nuclear Research, Geneva (Switzerland).
Preliminary Results of Charm Search.
L. Baum, M. Block, J. Crawford, B. Couchman, and A. Derevshchikov. 17 Apr 75, 6p

Descriptors: (*Charm particles, *Particle production), (*Proton-proton interactions, Charm particles), Colliding beams, Electrons, Pions.

For abstract, see NSA 32 08, number 20911.

UCR-34P107-170 PC$4.25/MF$2.25
California Univ., Riverside.
Annual Report (On High Energy Physics).
A. Kernan, and R. T. Poe. Jun 75, 24p
Contract AT(04-3)34

Descriptors: (*High energy physics, *Research programs), California, Diffraction models, Heavy ions, Protons, Streamer spark chambers, Strong interactions.

For abstract, see NSA 32 08, number 20884.

UCRL-77103 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Discovery of exp 259 FM.
D. C. Hoffman, J. Weber, J. B. Wilhelmy, E. K. Hulet, and R. W. Lougheed. 15 Aug 75, 6p
CONF-750913-3

Descriptors: (*Fermium 259, *Spontaneous fission), Fission fragments, Half-life, Kinetic energy, Fermium 257, Mev range 10-100, Protons, Stripping, Triton reactions.

For abstract, see NSA 32 08, number 21286.

UH-511-197-75 PC$4.00/MF$2.25
Hawaii Univ., Honolulu Dept. of Physics and Astronomy.
Space Time Structure of Neutral Current.
S. Pakvasa. Jun 75, 8p
Contract AT(04-3)-511

Descriptors: (*Neutral currents, *Space-time), (*Neutrino-nucleon interactions, *Inclusive interactions), Antineutrinos, Electrons, Positrons.

For abstract, see NSA 32 08, number 20948.

UUIP-884 PC$4.75/MF$2.25
Uppsala Univ. (Sweden). Fysiska Institutionen.
Possible Rotational States in Light Odd-In Nuclei.
W. Dietrich, I. Ragnarsson, A. Baecklin, and C. O. Lannergard. Nov 74, 31p
U.S. Sales Only.

Descriptors: (*Cadmium 106, *Deuteron reactions), (*Indium 107, *Rotational states), (*Cadmium 108, Deuteron reactions), (*Indium 109, Rotational states), Energy-level transitions, Gamma radiation, Mev range 01-10, Mev range 10-100, Neutrons, Nuclear deformation, Odd-even nuclei, One-nucleon transfer reactions, Potential energy, Stripping, Strutinsky theory.

For abstract, see NSA 32 08, number 21210.

WANL-TMI-1189 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Effect of the Statistical Fluctuations of Fission Width of U exp 235 .
C. A. Stevens. 29 Jul 64, 10p

Descriptors: (*Uranium 235, Neutron reactions), (*Neutron reactions, *Fission), Capture, Fluctuations, Level widths, Resonance integrals, Statistics.

For abstract, see NSA 32 08, number 21287.

WANL-TMI-1384 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Discrete Directions in S /sub n/ Quadrature.
W. Gray. 14 Jan 65, 11p

Descriptors: (*Neutron transport theory, *Quadratures), Computer codes, D codes, Neutron flux.

For abstract, see NSA 32 08, number 21066.

WANL-TMI-1576 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Effect of Changing the Boundary Energy Between GAM and Tns.
G. Gibson, and M. Melnick. 18 Oct 65, 5p

Descriptors: (*Beryllium, *Neutron flux), Computer codes, Cross sections, Ev range 01-10, G codes, Neutron transport, T codes.

For abstract, see NSA 32 08, number 21067.

WANL-TMI-475 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Preparation of Inelastic Scattering Data for Use in Monte Carlo Code 18-0.
D. W. Drawbaugh. 4 Feb 63, 3p

Descriptors: (*Titanium, Neutron reactions), (*Neutron reactions, *Inelastic scattering), Computer codes, Energy-level transitions, M codes, Monte carlo method.

For abstract, see NSA 32 08, number 21322.

ZFK-276 PC$4.00/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
Weak Coupling Model for Deformed Nuclei, Applied to the Nucleus exp 29 Si.
H. J. Wiebicke, and L. Muenchow. May 74, 19p
In German. U.S. Sales Only.

Descriptors: (*Silicon 29, *Energy levels), (*Weak-coupling model, Energy levels), Deformed nuclei, Even-even nuclei, Excitation, Nuclear cores, Strong-coupling model.

For abstract, see NSA 32 08, number 21323.

ZFK-277 PC$14.50/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
Differential Neutron Emission Cross Sections Sigmanm(E sub 0 ;E,theta) at 14.6 Mev Incident Energy for the Elements Be, C, NA, MG, al, Si, p, S, Ca, Ti, V, Cr, Mn, Fe, CO, NI, Cu, Zn, Ga, Se, Br, Zr, NB, Cd, In, SN, SB, I, TA, W, au, Hg, PB, and Bi.
D. Hermsdorf, A. Meister, S. Sassonoff, D. Seeliger, and K. Seidel. Jul 74, 228p
In German. U.S. Sales Only.

Descriptors: (*Light nuclei, *Neutron reactions), (*Intermediate mass nuclei, Neutron reactions), (*Heavy nuclei, Neutron reactions), (*Neutron emission, *Differential cross sections), Neutrons.

For abstract, see NSA 32 08, number 21111.

20I. Plasma Physics

AD-A015 617/4GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Effects of a Finite Debris Density Profile on the Development of the Longmire Shell,
D. L. Book, and R. W. Clark. Jun 75, 16p Rept no. NRL-MR-3066

Descriptors: *Magnetohydrodynamics, *Nuclear explosions, Plasmas(Physics), Instability.

Two models of the early-time spherical expansion of a debris plasma into a stationary magnetized plasma are compared. One is essentially that of Longmire, generalized to spherical geometry, while the second differs in possessing a finite (Gaussian) density profile at the leading edge, rather than the discontinuous profiles assumed by Longmire. In the finite-profile case a relatively thick shell of magnetic compression develops where the streaming and ambient plasma densities are comparable. At very early times, the peak magnetic intensity is much lower than that predicted by Longmire. Numerical calculations of high-altitude bursts provide quantitative agreement with analytical results. They also reveal that discontinuous profiles introduce unphysical processes. This confirms the theoretical analysis which shows that the discontinuous model can give rise to superluminous (v>c) electron velocities. It is thus shown that, even in the absence of anomalous plasma dissipative mechanisms, a realistic model of the debris fron is essential in simulating the evolution of the fireball and weapon debris.

AD-A015 787/5GA PC$3.25/MF$2.25
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Parametric Excitation of Alfven and Ion Acoustic Waves,
C. N. Lashmore-Davies, and R. S. B. Ong. 14 Feb 74, 5p AFOSR-TR-75-1433
Grant AF-AFOSR-2224-72
Availability: Pub. in Physical Review Letters, v32 n21 p1172-1175 May 74.

Descriptors: *Magnetohydrodynamic waves, Acoustic waves, Ions, Excitation, Mathematical models, Magnetic fields, Oscillation, Sine waves, Modulation, Plasma oscillations, Instability, Threshold effects, Decay, Great Britain, Reprints.
Identifiers: Alfven waves, Ion acoustic waves, Parametric excitation.

The threshold is derived for parametric excitation of Alfven waves in a uniform plasma in which the background magnetic field is modulated sinusoidally in time. Including the plasma pressure, it is shown that ion acoustic waves can also be excited directly. Both cases are absolutely unstable for any interaction length. Finally, an analysis is made of the subsequent decay of the excited Alfven wave into an ion acoustic and another Alfven wave.

AD-A015 838/6GA PC$3.25/MF$2.25
California Univ Los Angeles School of Engineering and Applied Science
Phase-Invariant Solutions of Nonlinear Wave-Wave Interacting Systems,
P. K. C. Wang. Jul 75, 24p Rept no. UCLA-ENG-7549 AFOSR-TR-75-1314
Grant AF-AFOSR-2662-74

Descriptors: *Plasmas(Physics), *Wave propagation, Nonlinear systems, Differential equations, Interactions.

The existence of phase-invariant solutions for a class of nonlinear wave-wave interacting systems is studied. These solutions have the property that the phase of each wave is invariant with time or unaffected by the nonlinear interactions. Explicit results are obtained for certain two-wave and three-wave systems. It is shown that for these systems, the wave-energy transfer along the phase-invariant solutions is always unidirectional. The application of these results to the nonlinear interaction between two transverse waves and a longitudinal wave in a magnetized collisionless plasma is discussed.

AD-A015 865/9GA PC$3.25/MF$2.25
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Ionospheric Aerodynamic Related to Satellites and Space Vehicles.
Final rept.,
R. S. B. Ong. 10 Aug 75, 16p AFOSR-TR-1856
Grant AF-AFOSR-2224-72

Descriptors: *Plasmas(Physics), *Atmosphere entry, *Ionosphere, Reentry vehicles, Artificial satellites, Ionospheric disturbances, Turbulence, High altitude, Instability, Plasma oscillations, Aerodynamic characteristics, Particle collisions, Coupling(Interaction), Saturation, Heterogeneity.

This report summarizes an investigation of the behavior of the ionospheric plasma at high altitudes and especially the onset and growth of disturbances due to the many kinds of instabilities inherently present in the nonhomogeneous plasma. Furthermore the nonlinear interactions among particles and waves are thoroughly studied.

AD-A015 903/8GA PC$4.25/MF$2.25
New York Univ N Y Magneto-Fluid Dynamics Div
Reflection of a Point Disturbance from a Conducting Wall in Two-Dimensional Magnetohydrodynamics.
Interim rept.,
Harold Weitzner. Jun 75, 57p AFOSR-TR-75-1396
Grant AF-AFOSR-2053-71

Descriptors: *Magnetohydrodynamics, *Plasmas(Physics), Wave propagation, Two dimensional, Green's function, Fourier transformation, Laplace transformation.

In order to study the effects of tied magnetic lines in ideal magnetohydrodynamics, the simple problem is treated of the reflection of an initial point disturbance, i.e. delta function, from a conducting wall in two-dimensional magnetohydrodynamics linearized about a constant state. The lowest order magnetic field is taken normal to the conducting wall. The conducting wall is the line x = 0 and the initial disturbance is at x = (x sub 0) > 0, y = 0. The solution separates into three parts, the ordinary wave generated by a point disturbance at x = (x sub 0), y = 0, a reflected wave centered at the image point x = -(x sub 0), y = 0, and a third uncentered wave. The first reflected wave contains a disturbance similar to the ordinary wave and a centered simple wave. The uncentered wave and its non-self-similar wave fronts are described. The presence of lacunae, line singularities, and the nature of the singularities at the wave fronts are discussed.

AD-A015 921/0GA PC$4.25/MF$2.25
Massachusetts Inst of Tech Cambridge Francis Bitter National Magnet Lab
Laser-Produced Plasmas and Radiation Sources.
Final rept. 1 Jul 72-30 Jun 75,
B. Lax, W. Halverson, and D. R. Cohn. Aug 75, 52p AFOSR-TR-75-1355
Contract F44620-72-C-0090

Descriptors: *Plasmas(Physics), *Carbon dioxide lasers, Heating, X rays, Gas dynamics, Shock waves, Laser beams, Helium, Electron energy, Impurities, Magnetic fields, Gas ionization.
Identifiers: *Laser produced plasmas, Plasma dynamics, Laser heating, Dielectric breakdown.

An experimental and theoretical study of CO2 Laser-induced gas breakdown, laser heating of magnetically confined plasma, and emission of soft X-rays from laser-heated plasma has been performed. Demonstrations were made of the roles of electron diffusion, pulse time, and inelastic losses in laser-induced gas breakdown. The phenomenon of CO2 laser beam self-trapping and associated plasma dynamics were studied. High-Z plasma impurities and magnetic field were shown to increase the heating and soft X-ray emission from CO2 laser-heated plasmas.

AD-A016 182/8GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
On the Shear Induced Growth and Damping of Waves.
Interim rept.,
Wallace M. Manheimer. Oct 75, 10p Rept no. NRL-MR-3139

Descriptors: *Plasmas(Physics), *Magnetohydrodynamic waves, Shear properties, Dispersion relations, Instability.

It is shown very simply with a time domain analysis that shear always stabilizes positive or negative energy waves. If the mode energy changes sign as a function of position however, shear may destabilize the wave.

CEA-CONF-3045 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Numerical Simulation of Neutral Injection on a Hot Electron Mirror Target Plasma.
C. Gormezano, G. Melin, and F. Werkoff. 1975, 4p CONF-750905-11
U.S. Sales Only.

Descriptors: (*Neutral atom beam injection, *Plasma simulation), (*Magnetic mirrors, Neutral atom beam injection), Electron temperature, Energy losses, Fokker-planck equation, Mathematical models.

For abstract, see NSA 32 08, number 19450.

CEA-CONF-3047 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Multispecies Diffusion Coefficients in the Pfirsch--Schluter and Banana Regimes for All Temperature and Mass Ratios.
P. Rolland, and F. Werkoff. 1975, 4p CONF-750905-13
U.S. Sales Only.

Descriptors: (*Collisional plasma, *Distribution functions), (*Plasma drift, Distribution functions), Fokker-planck equation.

For abstract, see NSA 32 08, number 19451.

CEA-CONF-3048 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Expressions for Impurity Ionization in Toroidal Magnetic Configurations.
G. Tonon. 1975, 4p CONF-750905-10
U.S. Sales Only.

Descriptors: (*Plasma, *Impurities), Analytical solution, Electric charges, Equilibrium plasma, Ionization, Toroidal configuration.

For abstract, see NSA 32 08, number 19452.

CEA-CONF-3049 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de la Physique du Plasma et de la Fusion Controlee.
Theory of Grill Launching for Lower Hybrid Resonance Heating.
M. Brambilla. 1974, 4p CONF-7409126-1
U.S. Sales Only.

Descriptors: (*Plasma heating, *Hybrid resonance), (*Tokamak devices, *High-frequency heating), Electromagnetic radiation, Maxwell equations, Waveguides.

For abstract, see NSA 32 08, number 19424.

CONF-750905-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Neoclassical Equilibrium and Transport Calculations for the Full Range of Collisionality.
C. O. Beasley, J. E. McCune, H. K. Meier, W. I. van Rij, and J. D. Callen. 1975, 4p

Descriptors: (*Collisional plasma, *Mathematical models), Distribution functions, Equilibrium plasma, Fokker-planck equation, Kinetic equations, Plasma drift, Toroidal configuration, Transport theory.

For abstract, see NSA 32 08, number 19453.

CONF-750905-4 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Results from the Elmo Bumpy Torus in a Theoretical Context.
C. L. Hedrick, R. A. Dandl, R. A. Dory, H. O. Eason, and G. E. Guest. 1975, 4p

Descriptors: (*Elmo bumpy torus, *Plasma macroinstabilities), Magnetic mirrors, Research programs, Toroidal configuration, Transport theory.

For abstract, see NSA 32 08, number 19468.

CONF-750905-6 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Interaction of Neutral Hydrogen and Plasma Including Wall Reflection.
J. F. Clarke, and D. J. Sigmar. 1975, 4p

Descriptors: (*Hot plasma, *Kinetic equations), (*Thermonuclear reactor walls, *Boundary conditions), Atoms, Charge exchange, Energy balance, Franck-condon principle, Hydrogen, Ionization, Ions, Linear momentum, Reflection.

For abstract, see NSA 32 08, number 19425.

CONF-750905-8 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Neoclassical Diffusion and Dissipative Trapped-Electron Instabilities in the Transition from the Banana to Plateau Collisionality Regime.
J. D. Callen, and K. T. Tsang. 1975, 4p

Descriptors: (*Plasma macroinstabilities, *Trapped-particle instability), (*Plasma drift, *Trapped electrons), Boundary layers, Distribution functions.

For abstract, see NSA 32 08, number 19469.

CONF-750905-9 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Nonlinear Evolution of Mhd Instabilities.
G. Bateman, H. R. Hicks, J. W. Wooten, and R. A. Dory. 1975, 4p

Descriptors: (*Plasma macroinstabilities, *Computer codes), Boundary conditions, Nonlinear problems, Plasma density, Three-dimensional calculations.

For abstract, see NSA 32 08, number 19470.

COO-2059-47 PC$5.75/MF$2.25
Iowa Univ., Iowa City Dept. of Physics and Astronomy.
Integration of the Vlasov Equation in Configuration Space.
C. Z. Cheng, and G. Knorr. Jun 75, 52p
Contract AT(11-1)-2059

Descriptors: (*Plasma, Boltzmann-vlasov equation), (*Boltzmann-vlasov equation, *Numerical solution), Boundary conditions, Distribution functions, Fourier analysis, Nonlinear problems, One-dimensional calculations.

For abstract, see NSA 32 08, number 19454.

COO-2276-6 PC$4.00/MF$2.25
Connecticut Univ., Storrs Dept. of Physics.
Annual Progress Report.
A. Russek. Jun 75, 4p
Contract AT(11-1)-2276

Descriptors: (*Plasma, *Impurities), Bremsstrahlung, Electron-ion collisions, Electrons, Ions, Recombination, Research programs.

For abstract, see NSA 32 08, number 19455.

COO-2444-2 PC$6.25/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y.
Development of a Beam Probe Diagnostic System for the United Aircraft "Lite" Program. Final Report, 1 April 1974--31 March 1975.
J. H. Stufflebeam, W. C. Jennings, K. A. Connor, and R. L. Hickok. Jul 75, 62p
Contract AT(11-1)-2444

Descriptors: (*Plasma diagnostics, *Ion beams), (*Laser-produced plasma, Plasma diagnostics), Electrostatic analyzers, Ion beam injection, Performance testing.

For abstract, see NSA 32 08, number 19432.

COO-2456-12 PC$4.00/MF$2.25
Columbia Univ., New York Plasma Lab.
Time Dependent Computer Simulation of an Electromagnetic Shock Tube.
C. K. Chu. 1974, 6p CONF-750606-6
Contract AT(11-1)-3086

Descriptors: (*Shock tubes, *Simulation), Computer calculations, Electromagnetic fields, Plasma simulation, Shock waves.

For abstract, see NSA 32 08, number 19456.

COO-2456-13 PC$4.00/MF$2.25
Columbia Univ., New York Plasma Lab.
Class of Unconditionally Stable Second-Order Implicit Schemes for Hyperbolic and Parabolic Equations.
H. C. Lui. 4p CONF-750606-7
Contract AT(11-1)-2456

Descriptors: (*Plasma, *Kinetic equations), Equations, Magnetohydrodynamics, Numerical solution, Plasma simulation, Stability.

For abstract, see NSA 32 08, number 19457.

COO-2456-14 PC$4.00/MF$2.25
Columbia Univ., New York.
Numerical Solution of the M.H.D. Plasma Equilibrium Equation.
M. F. Reusch. Jun 75, 2p CONF-750606-4

Descriptors: Differential equations, Equilibrium plasma, Magnetic fields, Magnetohydrodynamics, Numerical solution, Plasma simulation.

For abstract, see NSA 32 08, number 19458.

COO-2456-15 PC$4.00/MF$2.25
Columbia Univ., New York.
Initial Shock Heating in a High beta Belt Pinch.
R. Taussig. Jun 75, 4p CONF-750606-5

Descriptors: (*Plasma heating, *Shock heating), (*Belt pinch, Shock heating), Equilibrium plasma, High-beta plasma, Lagrange equations, One-dimensional calculations, Plasma density.

For abstract, see NSA 32 08, number 19426.

COO-3237-50 PC$4.00/MF$2.25
Institute for Advanced Study, Princeton, N.J.

Theoretical Plasma Physics Research. Progress Report.
5p
Contract E(11-1)-3237

Descriptors: (*Tokamak devices, *Plasma macroinstabilities), Kink instability, Nonlinear problems, Plasma microinstabilities, Trapped-particle instability.

For abstract, see NSA 3208

EUR-CEA-FC-761 PC$5.25/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Physique du Plasma et de la Fusion Controlee.
Bibliographic Review of Ionization, Recombination, and Excitation Coefficients of Impurities Present in a Plasma.
M. Mattioli. Feb 75, 45p
In French. U.S. Sales Only.

Descriptors: (*Plasma, *Bibliographies), (*Tokamak devices, *Impurities), Excitation, Ionization, Recombination.

For abstract, see NSA 32 08, number 19420.

FRNC-TH-520 PC$7.50/MF$2.25
Toulouse-3 Univ., 31 (France).
Mechanism of the Discharges Established in Display Panels with Dielectric Walls.
K. H. Mohamed. 1974, 86p
In French. U.S. Sales Only.

Descriptors: Display devices, Electric discharges, Numerical solution, Simulators.

For abstract, see NSA 32 08, number 19439.

IPP-IV-81 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Investigation of Laser-Target Interactions with Picosecond Microphotography.
S. Ariga, and R. Sigel. Mar 75, 9p CONF-750315-1
U.S. Sales Only.

Descriptors: (*Laser-produced plasma, Plasma diagnostics), (*Plasma diagnostics, *Photography), Deuterium, Dye lasers, Interactions, Laser radiation, Neodymium lasers, Plasma expansion, Shock waves.

For abstract, see NSA 32 08, number 19434.

IPP-IV-82 PC$7.25/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Coupling and Absorption of Lower-Hybrid Waves in a Thermonuclear Plasma.
S. Puri, and M. Tutter. Mar 75, 84p
U.S. Sales Only.

Descriptors: (*Plasma waves, *Coupling), Absorption, Electromagnetic radiation, Hybrid resonance, Magnetic fields, Plasma.

For abstract, see NSA 32 08, number 19521.

IPP-1/152 PC$4.75/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Survey on the Mhd Stability Theory of Axisymmetric Toroidal Equilibria with Circular and Elongated Plasma Cross Sections.
O. Gruber. Mar 75, 33p
In German. U.S. Sales Only.

Descriptors: Aspect ratio, Electric currents, High-beta plasma, Kink instability, Plasma macroinstabilities, Stabilization, Toroidal configuration.

For abstract, see NSA 32 08, number 19472.

IPP-2/228 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Resonance Cones of Electron Plasma Waves in Toroidal, Inhomogeneous Plasmas.
P. Javel, G. Mueller, U. Weber, and R. R. Weynants. Mar 75, 18p
U.S. Sales Only.

Descriptors: (*Electron plasma waves, *Resonance), Hybrid resonance, Inhomogeneous plasma, Ionization, Plasma heating, Toroidal configuration.

For abstract, see NSA 32 08, number 19520.

IPP-6/135 PC$6.75/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Investigations of the Monotonicity of Difference Schemes for Diffusion Equations.
J. Steuerwald. Apr 75, 72p
In German. U.S. Sales Only.

Descriptors: (*Plasma, *Kinetic equations), Boundary conditions, Differential equations, Diffusion, Plasma drift.

For abstract, see NSA 32 08, number 19461.

LA-UR-75-885 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Scyllac "Derated" Feedback Sector Experiments.
E. L. Cantrell, W. R. Ellis, and B. L. Freeman. 1975, 5p CONF-750905-2
Contract W-7405-ENG-36

Descriptors: (*Scyllac devices, Plasma macroinstabilities), (*Plasma macroinstabilities, *Stabilization), Feedback, Plasma instability, Toroidal configuration.

For abstract, see NSA 32 08, number 19473.

MATT-1067 PC$6.25/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Nonlinear Coupling of Kink Modes in Tokamaks.
R. Y. Dagazian. Jul 75, 62p
Contract AT(11-1)-3073

Descriptors: (*Plasma macroinstabilities, *Kink instability), (*Tokamak devices, Kink instability), Coupling, Lagrange equations, Nonlinear problems, Stabilization.

For abstract, see NSA 32 08, number 19474.

MATT-1138 PC$4.25/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
System for Rapid Injection of Metal Atoms into Plasmas.
E. S. Marmar, J. L. Cecchi, and S. A. Cohen. Jul 75, 24p

Descriptors: (*Tokamak devices, *Impurities), Ev range 10-100, Ion sources, Neutral atom beam injection, Plasma confinement.

For abstract, see NSA 32 08, number 19427.

MATT-1146 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Stabilization of Trapped Particle Modes by Reversed Gradient Profiles.
W. M. Tang, P. H. Rutherford, H. P. Furth, and J. C. Adam. Jul 75, 15p
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, *Trapped-particle instability), (*Plasma macroinstabilities, Trapped-particle instability), Plasma density, Stabilization, Temperature gradients.

For abstract, see NSA 32 08, number 19475.

NP-20506 PC$4.75/MF$2.25
Chalmers Tekniska Hoegskola, Goeteborg (Sweden). School of Electrical Engineering.
Institute for Electromagnetic Field Theory and Plasma Physics Annual Report, 1974.
1974, 35p
In Swedish and English. U.S. Sales Only.

Descriptors: (*Plasma, *Research programs), Electromagnetic fields, Electron beams, Laser radiation, Stochastic processes, Turbulence.

For abstract, see NSA 3208

NP-20510 PC$10.25/MF$2.25
Instituto Politecnico Nacional, Mexico City. Escuela Superior de Ingenieria Mecanica y Electrica.
Design and Fabrication of a Container Exposed to High Vacuum Used in an Ion Polarization System.
J. M. A. O. Cano. 1975, 142p
In Spanish. U.S. Sales Only.

Descriptors: (*Cesium ions, Ion sources), (*Ion sources, *Design), Aluminium, Containers, Fabrication, High vacuum, Polarization, Polarized beams, Vacuum systems.

For abstract, see NSA 32 08, number 20785.

N75-30886/6GA PC$3.75
Paris-Sud Univ., Orsay (France). Lab. de Physique des Plasmas.
High Pressure Working Mode of Hollow Cathode Spark Discharges Fonctionnement a Haute Pression des Decharges d'Arc a Cathode Creuse.
Final Report.
H. Minoo, and C. Popovici. Jul 74, 32p
Contract DGRST-69-0-1792
Language in French.

Descriptors: *Arc discharges, *High pressure, *Hollow cathodes, *Temperature distribution, Circular tubes, Graphs (Charts), Heat balance, Performance tests.

For abstract, see STAR 1321

N75-30887/4GA PC$3.75/MF$2.25
Stanford Univ., Calif.
Theoretical and Experimental Studies of Space-Related Plasma Wave Propagation and Resonance Phenomena.
Semiannual Report, 1 Jan. - 30 Jun. 1975.
F. W. Crawford. Jul 75, 36p NASA-CR-143335, SU-IPR-636
Contract NGL-05-020-176

Descriptors: *Plasma waves, *Resonance, *Wave propagation, Backscattering, Frequency stability, Ionospheric heating, Whistlers.

For abstract, see STAR 1321

ORNL-TM-5008 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Excitation of Short Wavelength Alfven Oscillations by High Energy Ions in Tokamak.
C. O. Beasley, Jr., J. G. Lominadze, and A. B. Mikhailovskii. Aug 75, 9p
Contract W-7405-eng-26

Descriptors: (*Tokamak devices, *Alfven waves), (*Plasma instability, Alfven waves), Excitation, Ions, Trapped-particle instability.

For abstract, see NSA 32 08, number 19476.

SAND-75-0369 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Long Focal-Length Telemicroscope for Laser Target Alignment.
G. L. Cano. Jul 75, 15p
Contract AT(29-1)-789

Descriptors: (*Lasers, *Optical systems), Alignment, Focusing, Laser radiation, Microspheres, Targets.

For abstract, see NSA 32 08, number 19466.

UCID-16851 PC$5.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Two-Component Experiments in 2XIIB.
B. G. Logan. 29 Jul 75, 41p

Descriptors: (*2x devices, *Ion temperature), Electrons, Ion density, Lifetime, Neutral atom beam injection, Thermonuclear fuels.

For abstract, see NSA 32 08, number 19429.

UCRL-51787 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Cylindrical Laser Targets.
J. A. Rinde. 5 Jun 75, 8p
Contract W-7405-Eng-48

Descriptors: (*Thermonuclear fuels, *Machining), (*Laser implosions, *Targets), Cylindrical configuration, Deuterium, Fabrication, Tritium.

For abstract, see NSA 32 08, number 19467.

UCRL-76667 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Interferometric Reconstruction of Electron Number Densities in Laser-Induced Plasmas.
D. W. Sweeney, D. T. Attwood, and L. W. Coleman. 4 Aug 75, 8p CONF-750801-3

Descriptors: (*Plasma diagnostics, *Holography), (*Laser-produced plasma, *Electron density), Bessel functions, Fourier analysis, Interferometry.

For abstract, see NSA 32 08, number 19435.

20J. Quantum Theory

AD-A015 778/4GA PC$3.25/MF$2.25
Georgia Univ Athens
On the Energy of a Thomas-Fermi System,
George S. Handler. 1970, 5p AFOSR-TR-75-1408
Grant AF-AFOSR-1137-66
Availability: Pub. in International Jnl. of Quantum Chemistry, v3S p703-706 1970.

Descriptors: *Quantum theory, *Quantum statistics, Fermi surfaces, Hamiltonian, Matrices(Mathematics), Electron energy, Reprints.
Identifiers: Thomas Fermi theory.

The energy relation in the quasi-classical statistical theory of electronic energies (Thomas-Fermi theory) is examined with a view to explaining the fact that these energies appear often to violate the Rayleigh-Ritz variation principle. (Author)

AD-A016 066/3GA PC$3.25/MF$2.25
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
Continued Fraction Perturbation Theory: Applications to Radiative Processes in the Dipole Approximation,
S. Swain. 7 Nov 74, 24p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics A: Mathematics General, v8 n8 p1277-1297 1975.

Descriptors: *Electron transitions, *Atomic spectroscopy, *Emission spectra, Hamiltonian, Angular momentum, Perturbation theory, Atomic energy levels, Dipoles, Electromagnetic fields, Damping, Approximation(Mathematics), Reprints.
Identifiers: Electric dipoles, Spontaneous emission, Stimulated emission, Line profiles, Lamb shifts.

A general perturbation procedure is described for writing down the contributions to any order for the probability of a quantum system described by a time-independent Hamiltonian making a transition from an arbitrary initial state to an arbitrary final state. The results are expressed in terms of certain propagators which involve continued fractions, so that some processes are summed to all orders. The general theory is then applied to a single multilevel atom interacting with any number of modes of the electromagnetic field in the electric dipole approximation. This work may be regarded as a generalization of earlier treatments of the corresponding single-mode, two-level atom problem involving the continued fraction approach. We are mainly concerned with the fundamental theory here, but a detailed discussion is given of spontaneous and stimulated emission. Expressions for the lineshape are derived incorporating the generalized Lamb shifts and damping constants. (Author)

AD-A016 070/5GA PC$3.25/MF$2.25
Kansas State Univ Manhattan Dept of Physics
Theoretical Fluorescence Yields for Neon,
C. P. Bhalla. 18 Feb 75, 9p ARO-9827.27-P
Grant DAHC04-74-G-0137
Availability: Pub. in Physical Review A, v12 n1 p122-128 Jul 75.

Descriptors: *Neon, *Fluorescence, Excitation, Quantum chemistry, X rays, Auger electrons, Ionization, Reprints.

No abstract available.

AD-A016 080/4GA PC$3.25/MF$2.25
Brown Univ Providence R I
On the 3d Electron Contribution to the Electronic Structure of Tetrahedral I-III-VI sub 2 Compounds,
J. Gan, J. Tauc, V. G. Lambrecht, Jr., and M. Robbins. 24 Apr 74, 5p ARO-10733.4-P
Grant DA-ARO-D-31-124-72-G204
Availability: Pub. in Solid State Communications, v15 n3 p605-607 1974.

Descriptors: *Ternary compounds, *Semiconductors, *Band theory of solids, Single crystals, Copper compounds, Indium compounds, Zinc selenides, Reflectivity, Spectra, Reprints.
Identifiers: *Electronic structure.

The reflectivity of single crystals of (CuInSe2)sub(1-x)-(2ZnSe)sub x which have the chalcopyrite structure for x < or = 0.43 and the sphalerite structure for x > or = 0.48 was measured. A band near 3 eV was observed for all compositions in the chalcopyrite structure but was not seen in the sphalerite phase. Its abrupt disappearance from x = 0.43 to x = 0.48 indicates that it may not be due to transitions from the copper d-levels to the lowest conduction band but may be associated with interband pseudo-direct transitions which become allowed by zone folding. (Author)

AD-A016 083/8GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Mason Lab
Negative Ion Formation, Vibrational Excitation, and Transmission Spectroscopy in Hydrogen Halides,
J. P. Ziesel, I. Nenner, and G. J. Schulz. 8 Apr 75, 9p ARO-11041.10-P
Grant DA-ARO-D-31-124-73-G66
Availability: Pub. in Jnl. of Chemical Physics, v63 n5 p1943-1949, 1 Sep 75.

Descriptors: *Hydrogen compounds, *Bromides, *Hydrogen chloride, *Ions, *Excitation, Vibration, Electron scattering, Deuterium compounds, Halides, Electron spectroscopy, Reprints.

No abstract available.

COO-2271-50 PC$4.25/MF$2.25
Columbia Univ., New York.
Possible New Form of Matter at High Density.
T. D. Lee. 1974, 23p CONF-741164-1

Descriptors: (*Quantum field theory, *Vacuum states), Density, Domain structure, Excitation, Field theories, Low temperature, Magnetic fields, Nuclear deformation, Nuclear structure.

For abstract, see NSA 32 08, number 21393.

HU-TFT-74-24 PC$8.00/MF$2.25
Helsinki Univ. (Finland). Research Inst. for Theoretical Physics.
Partial Diagonalization of Bethe--Salpeter Type Equations.
C. Cronstroem. 1974, 98p
U.S. Sales Only.

Descriptors: (*Bethe-salpeter equation, *Analytical solution), Asymptotic solutions, Integral equations, Kernels, Linear momentum transfer, Lorentz groups, O groups, Scattering amplitudes.

For abstract, see NSA 32 08, number 21394.

IFA-FR-123-1975 PC$4.00/MF$2.25
Institutul de Fizica Atomica, Bucharest (Romania).
Application of the Artificial Satellite of the Earth to Determine the Velocity of the Gravitational Interaction within Newtonian Gravitational Fields.
G. Cristea. Jan 75, 8p
U.S. Sales Only.

Descriptors: (*Gravitational interactions, *Velocity), Classical mechanics, Gravimetry, Lasers, Satellites.

For abstract, see NSA 32 08, number 21422.

JINR-E2-8632 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Remarks About Singular Solutions to the Dirac Equation.
M. Uhlir. 1975, 23p
U.S. Sales Only.

Descriptors: (*Dirac equation, *Analytical solution), Eigenfunctions, Electromagnetic fields, Multipoles, Scalar fields, Singularity, Spinors.

For abstract, see NSA 32 08, number 21378.

JINR-E2-8796 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Consequence of Causality Condition in Field Theory with Momentum Space of Constant Curvature.
I. P. Volobuev. 1975, 19p
U.S. Sales Only.

Descriptors: (*Scalar fields, *Causality), Commutators, Integrals, Jost function, Linear momentum, Mathematical space.

For abstract, see NSA 32 08, number 21397.

JINR-E2-8838 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Possible Conceptual Difficulties of Quantum Field Theories Involving Gravitation.
M. A. Markov. 1975, 20p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Measure theory), (*Space-time, Measure theory), Electric fields, Errors, Gravitation, Gravitational fields, Quantum mechanics.

For abstract, see NSA 32 08, number 21398.

JINR-E2-8892 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Solution of the Charge Quantization Problem.
V. G. Kadyshevskii, M. D. Mateev, and R. M. Mir-Kasimov. 1975, 11p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Electric charges), Boundary conditions, De sitter group, Electromagnetic fields, Gauge invariance, Linear momentum, Mathematical space, Minkowski space, Scalars, Virtual states.

For abstract, see NSA 32 08, number 21399.

JINR-E4-8818 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Rigorous Statement About Systems Interacting with Boson Field.
V. A. Zagrebnov, I. G. Brankov, and N. S. Tonchev. 1975, 11p
U.S. Sales Only.

Descriptors: (*Bosons, *Quantum field theory), Interactions, Many-body problem.

For abstract, see NSA 32 08, number 21379.

JINR-P2-8877 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Scale Transformations and Fundamental Length.
V. G. Kadyshevskii, M. D. Mateev, and R. M. Mir-Kasimov. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Quantum field theory, *Inclusive interactions), Distribution functions, Elementary length, Scale invariance, Total cross sections.

For abstract, see NSA 32 08, number 21400.

ORO-3992-217 PC$5.25/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Structure of Barnacled Relativistic Wave Equations.
M. A. K. Khalil. 31 Jul 75, 44p

Descriptors: (*Wave functions, *Lorentz invariance), Coupling, Electromagnetic fields, Hermitian matrix, Relativistic range, SI groups.

For abstract, see NSA 32 08, number 21381.

ORO-3992-223 PC$4.00/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Exact Magnetic Monopole Solutions in Yang--Mills' and Unified Gauge Theories.
J. P. Hsu. 1975, 17p

Descriptors: (*Magnetic monopoles, *Unified gauge models), Gauge invariance, Symmetry, Tensors, Yang-mills theory.

For abstract, see NSA 32 08, number 21401.

ORO-3992-224 PC$4.00/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Violation of Unitarity in a Finite Quantum Electrodynamics.
J. P. Hsu, and E. Mac. Aug 75, 8p

Descriptors: (*Quantum electrodynamics, *Unitarity), Electron-positron interactions, Scattering amplitudes.

For abstract, see NSA 32 08, number 21402.

ORO-3992-226 PC$4.00/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Regular Perturbations in a Vector Space with Indefinite Metric.
C. C. Chiang. Aug 75, 18p
Contract AT(40-1)-3992

Descriptors: (*Mathematical space, *Perturbation theory), (*Vector fields, Perturbation theory), Mathematical operators, Metrics, Vectors.

For abstract, see NSA 32 08, number 21382.

20K. Solid Mechanics

AD-A015 660/4GA Not available NTIS
Naval Research Lab Washington D C Shock and Vibration Information Center
The Shock and Vibration Digest. Volume 7, Number 9, September 1975.
Sep 75, 110p
Availability: Shock and Vibration Center, Naval Research Lab., Code 8404, Washington, D. C. 20375. Annual subscription $40.00.

Descriptors: *Vibration, *Shock(Mechanics), Periodicals, Bibliographies, Abstracts, Naval research, Transients, Integration, Algorithms, Damping, Naval equipment, Structural response.

No abstract available.

AD-A015 663/8GA PC$3.25/MF$2.25
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
Note on Axial-Shear and Contour Vibrations of Prisms.
Technical rept.,
R. D. Mindlin. May 75, 24p Rept no. TR-31
Contract N00014-67-A-0108-0027

Descriptors: *Elastic properties, *Vibration, *Shear properties, Rods, Equations, Contours, Modes, Solutions(General), Beams(Structural).
Identifiers: Bars.

Exact solutions of the equations of the linear theory of elasticity are given for axial-shear modes of vibration of an isotropic, prismatic bar whose normal section is an equilateral triangle or has the equilateral triangle as a module. A family of contour modes is also described for bars with a rhombic section formed of two equilateral triangles and with sections having the rhombus as a module. (Author)

AD-A015 671/1GA PC$5.25/MF$2.25
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
Inelastic Buckling of Plates Allowing for Shear Effects.
Technical rept.,
Suresh Chandra Shrivastava, and Hans H. Bleich. Jul 75, 102p Rept no. TR-49
Contract N00014-75-C-0695

Descriptors: *Buckling, *Shear properties, *Plates, Plastic deformation, Loads(Forces), Transverse, Hardening, Sandwich panels.
Identifiers: *Inelastic buckling.

The inelastic buckling including the effects of transverse shear is analyzed for flat rectangular plates in uniform uniaxial compression. Using a hardening material obeying the von Mises yield condition, the problem is treated according to both the incremental and deformation theories of plasticity. The analysis is based on Shanley's concept of continuous loading. Using boundary conditions which permit separation of variables it becomes possible to solve the resulting ordinary differential equations by asymptotic approximations giving closed form expressions for the critical loads. The correction terms due to shear effects were obtained for infinitely long, and for square, simply supported plates, and for infinitely long ones, simply supported on three sides and free on one unloaded edge. The analysis presented is also suitable for sandwich plates. (Author)

AD-A015 729/7GA PC$3.25/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
Effect of Plastic Prestrain on the Tensile Strain to Failure of Beryllium.
Interim rept. Jul-Dec 74,
T. Nicholas. Jun 75, 25p Rept no. AFML-TR-75-52

Descriptors: *Tensile stress, *Plastic deformation, *Strain(Mechanics), Fatigue(Mechanics), Compressive properties, Beryllium, Shells(Structural forms), Skin(Structural), Ductility, Guided missiles.
Identifiers: Bauschinger effect.

Results of tensile tests on specimens of CIP/HIP P-1 beryllium previously prestressed into the plastic range are presented. Two types of prior deformation are considered, a plastic precompression and a plastic pretension followed by plastic compression. Data from tests involving levels of prestress between 40 and 55 ksi (276 and 379 MPa) show no reduction in the uniaxial tensile strain to failure as a result of prior plastic deformations as high as one percent. An increase in tensile flow stress is observed for the precompressed specimens. (Author)

AD-A015 864/2GA PC$4.75/MF$2.25
Aerospace Corp El Segundo Calif Lab Operations
Statistical Fracture of Brittle Materials; Progress on J. O. 5628 during FY 75 and Plans for FY 76.
Interim rept.,
Samuel B. Batdorf, Richard H. Huddlestone, and David C. Pridmore-Brown. 2 Sep 75, 77p
Rept no. TR-0076(9990)-1 SAMSO-TR-75-222
Contract F04701-75-C-0076

Descriptors: *Brittleness, *Materials, *Fracture(Mechanics), *Failure(Mechanics), *Statistical processes, Cracking(Fracturing), Statistical distributions, Mathematical prediction, Stresses, Models, Loads(Forces), Distribution functions.
Identifiers: *Brittle materials, *Fracture statistics.

The reasons why an improved understanding of the statistics of failure of brittle materials is important to the armed services are briefly reviewed. In addition, the status of work at Aerospace prior to undertaking the present work, which is supported by the Office of Naval Research and the Air Force Office of Scientific Research, and the technical proposal are reviewed. The tasks accomplished in FY 75 are discussed in some detail in Section II, subject to the limitation that this report was prepared two months prior to the end of the fiscal year. The major items of interest are: (1) a literature search for fracture data useful for validating or correcting theories, (2) recent discoveries that relate the theory for surface-distributed cracks to that for volume-distributed cracks, (3) work on the graphite model of Buch, Zimmer, and Meyer, (4) effects of porosity and crack interaction, and (5) the significance of asymptotic forms (such as the Weibull theory) in extreme value statistics.

AD-A015 866/7GA PC$7.00/MF$2.25
Technion - Israel Inst of Tech Haifa Dept of Aeronautical Engineering

Transient Response of an Elastic Half Space to an Embedded Cylindrical Load by a Two-Spatial Characteristics Computer Code,
M. Ziv. May 75, 188p Rept no. TAE-250 AFOSR-TR-75-1275
Grant AF-AFOSR-2330-72

Descriptors: *Mechanics, *Wave propagation, *Method of characteristics, *Elastic properties, *Finite difference theory, *Computer programs, *Boundary value problems, Stresses, Transients, Loads(Forces), Kinematics, Numerical analysis, Machine coding, Partial differential equations, Integral transforms, Solids.
Identifiers: *Elastic halfspace.

Stress wave propagation in a quarter-plane is presented here via the configuration of the following boundary value problem: The transient motion of an elastic half-space is considered, where an impulsive load is applied to the boundary of a cylindrical cavity embedded in the half-space. The cylindrical cavity extends from the free surface of the half-space into its infinite interior and the load is uniformly and radially distributed over the entire boundary of the cavity. The method consists of superimposing compatible kinematical relations, existing across strong discontinuity surfaces, on the multi-dimensional theory of characteristics. A wave grid is then constructed and the integration along these fronts is carried out numerically using the finite-difference technique. Although this method has already been established by the author it is repeated here in a modified version, for the sake of clarity. Stress distribution and velocity of the particles as well as longitudinal, shear, and head waves are revealed in the solution of the elastic quarter-plane. For the solution a new computer program is developed. The computer output consists of two kinds of lists and three kinds of plots for the variables.

AD-A015 948/3GA PC$6.25/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
An Updated Guide to the Use of General Bending Response Program (GBRP).
Research and development rept.,
Michael E. Golden, and Francis M. Henderson.
Apr 75, 152p Rept no. NSRDC-4601

Descriptors: *Bending, *Computer programs, *Shafts(Machine elements), Propellers(Marine), Vibration, Structural response, Transients, Ship hulls, Excitation, Damping, Instruction manuals, Subroutines, Overlays, Data management, Input output processing, Torsion, Propulsion system components, Coupling(Interaction), Marine engineering.
Identifiers: General bending response computer program, Propeller shafts.

A new version of General Bending Response Program, a computer program for ship vibration analysis, has been established on the Center's CDC computing system. This version differs from former versions primarily by permitting users to dynamically adjust computer core to fit the needs of any particular application. The report documents the use of the program to: (1) calculate the vibratory forces in a propeller shaft; (2) check the accuracy of normal mode shapes computed with the program's natural frequency option; and (3) obtain SC-4020 plots of computed results. Sample problems demonstrate each of these applications. (Author)

AD-A016 056/4GA PC$3.75/MF$2.25
California Univ Berkeley Dept of Mechanical Engineering
On the Formulation of Contact Problems of Shells and Plates.
Technical rept.,
P. M. Naghdi. Sep 75, 39p Rept no. AM-75-2
Contract N00014-75-C-0148

Descriptors: *Shells(Structural forms), *Plates, Equations of motion, Kinematics, Nonlinear systems.
Identifiers: Shell theory, Cosserat surfaces, Contact problems.

The equations of motion in terms of resultants and the constitutive equations in the theory of shells and plates are ordinarily derived from the three-dimensional equations relative to an interior surface, often taken to be the middle surface in the reference configuration of the shell-like body. This usual formulation is not, in general, applicable to contact problems of shells for which one of the major surfaces, e.g., the upper surface, is specified as the reference surface. The present paper is concerned with the transformation relations between the relevant variables (and hence also the response functions) of the traditional formulation and one which can be obtained relative to one of the major surfaces.

AD-A016 141/4GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Taming a Phenomenon,
A. Silin. 2 May 75, 9p Rept no. FTD-ID(RS)I-1281-75
Edited trans. of Krasnaya Zvezda (USSR) p4 8 Dec 74, by Carol S. Nack.

Descriptors: *Friction, Wear, Machines, Radiation, Translations, USSR.

This translation presents a discussion of friction and methods for reducing friction. The relation between wear and efficiency of machinery is described.

AD-A016 173/7GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Dept of Applied Mathematics
Nonlinear Problems in Continuum Mechanics.
Final rept. 1 Sep 67-31 Dec 74,
H. B. Keller. 19 Sep 75, 8p ARO-7625.37-M
Contract DAHC04-68-C-0006

Descriptors: *Continuum mechanics, *Numerical methods and procedures, Nonlinear systems, Partial differential equations, Boundary value problems, Plates, Shells(Structural forms), Buckling, Boundary layer flow.
Identifiers: Two point boundary value problems.

The main areas of mathematical study included: nonlinear eigenvalue problems for ordinary and partial differential equations, bifurcation theory of stationary and time dependent processes, iterative methods for nonlinear equilibrium problems, numerical methods for two point boundary value problems, numerical methods for nonlinear diffusive systems. Some of the physical problems treated concerned: buckling of plates and shells, spontaneous combustion, tubular, batch and pellet chemical reactors, biochemical diffusion processes, laminar and turbulent boundary layer flows and nuclear reactors.

AD-A016 186/9GA PC$3.75/MF$2.25
Stanford Univ Calif Systems Optimization Lab
The Parametric Linear Complementarity Problem in the De Donato-Maier Analysis of Reinforced Concrete Beams.
Technical rept.,
Ikuyo Kaneko. May 75, 38p Rept no. SOL-75-13
Contracts N00014-75-C-0267, NSFMPS71-03341

Descriptors: *Beams(Structural), *Reinforced concrete, *Loads(Forces), Mathematical models, Matrices(Mathematics), Simplex method, Mathematical programming.
Identifiers: *Structural analysis, Parametric complementarity problem, Linear complementarity problem, De Donato-Maier method.

This paper reviews two structural engineering problems arising in the analysis of reinforced concrete beams. Based on the work of De Donato and Maier, the paper elucidates the role played by parametric linear complementarity in the structural analysis.

N75-30589/6GA PC$26.50
Engineering Sciences Data Unit, London (England).
Estimation of the Local Buckling Stress under Biaxial Compression of an Isotropic Skin with Fibre Reinforced Integral Unflanged Stiffeners.
11 Nov 73, 4p ESDU-73015
Misc-Amendment a.

Descriptors: *Buckling, *Flat plates, *Reinforced plates, *Stress analysis, Carbon fibers, Composite materials, Glass fibers, Reinforced plastics, Tables (Data).

For abstract, see STAR 1321

N75-30594/6GA PC$3.25/MF$2.25
Technische Hogeschool, Delft (Netherlands). Dept. of Aeronautical Engineering.
Fatigue Crack Growth under Variable-Amplitude Loading.
J. Schijve. Apr 74, 18p VTH-181
Conf-Presented at Conf. On the Prospects of Advanced Fracture Mechanics, Delft, Netherlands, 24-28 Jun. 1974.

Descriptors: *Amplitude distribution analysis, *Crack initiation, *Fatigue life, Crack propagation, Load distribution (Forces), Mathematical models, Stress concentration.

For abstract, see STAR 1321

N75-30595/3GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Design of Structures for Optimum Geometry.
G. N. Vanderplaats. Aug 75, 12p NASA-TM-X-62462, A-6204

Descriptors: *Cost reduction, *Structural design, *Trusses, *Weight reduction, Joints (Junctions), Mechanical properties.

For abstract, see STAR 1321

N75-30598/7GA PC$6.25/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
Numerical Nonlinear Inelastic Analysis of Stiffened Shells of Revolution. Volume 2: User'S Manual for Stars-2P Digital Computer Program.
V. Svalbonas, and H. Levine. Jul 75, 167p NASA-CR-2559-VOL-2, M142
Contract NAS8-28569

Descriptors: *Bodies of revolution, *Elastic properties, *Numerical analysis, *Rigid structures, *User manuals (Computer programs), Computer programs, Digital computers, Shells (Structural forms).

For abstract, see STAR 1321

N75-30599/5GA PC$7.25/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
Numerical Nonlinear Inelastic Analysis of Stiffened Shells of Revolution. Volume 3: Engineer'S Program Manual for Stars-2P Digital Computer Program.
V. Svalbonas, H. Levine, and P. Ogilvie. Jul 75, 207p NASA-CR-2559-VOL-3, M142
Contract NAS8-28569

Descriptors: *Bodies of revolution, *Elastic properties, *Rigid structures, *User manuals

(Computer programs), Computer programs, Fortran, Shells (Structural forms), Subroutine libraries (Computers).

For abstract, see STAR 1321

N75-30600/1GA PC$4.25/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
Numerical Nonlinear Inelastic Analysis of Stiffened Shells of Revolution. Volume 4: Satellite-1P Program for Stars-2P Digital Computer Program.
V. Svalbonas, and P. Ogilvie. Jul 75, 51p NASA-CR-2559-VOL-4, M142
Contract NAS8-28569

Descriptors: *Bodies of revolution, *Elastic properties, *Error correcting codes, *Error detection codes, *Rigid structures, *User manuals (Computer programs), Computer programs, Digital techniques, Fortran, Shells (Structural forms), Univac 1108 computer.

For abstract, see STAR 1321

N75-30601/9GA PC$3.25/MF$2.25
Indian Inst. of Science, Bangalore.
Accurate Determination of Stress Concentrations around Elliptical Holes in Cylindrical Shells.
M. V. V. Murthy, K. P. Rao, and A. K. Rao. 14 Sep 73, 13p
Conf-Presented at 2D Intern. Conf. On Struct. Mech. In Reactor Tech., Berlin, 10-14 Sep. 1973.

Descriptors: *Cylindrical shells, *Perforated shells, *Stress concentration, Axial stress, Fourier series, Hole distribution (Mechanics), Mathieu function, Numerical analysis.

For abstract, see STAR 1321

N75-30602/7GA PC$3.25/MF$2.25
Indian Inst. of Science, Bangalore.
Stress Concentrations around Plain and Reinforced Holes in Cylindrical and Spherical Shells.
K. P. Rao, and P. Prakash. 14 Sep 73, 14p
Conf-Presented at 2D Intern. Conf. On Struct. Mech. In Reactor Technol., Berlin, 10-14 Sep. 1973.

Descriptors: *Cylindrical shells, *Perforated shells, *Spherical shells, *Stress concentration, Hole distribution (Mechanics), Numerical analysis, Perturbation theory.

For abstract, see STAR 1321

N75-30603/5GA PC$4.75/MF$2.25
Boeing Co., Seattle, Wash. Research and Engineering Div.
Advanced Beaded and Tubular Structural Panels.
Final Report.
M. D. Musgrove, and B. E. Greene. Sep 75, 100p NASA-CR-2514
Contract NAS1-10749

Descriptors: *Computer programs, *Curved panels, *Design analysis, *Rigid structures, Bending moments, Compression tests, Elastic buckling, Moire effects, Nondestructive tests, Plastic properties, Shear stress.

For abstract, see STAR 1321

N75-30604/3GA PC$4.25/MF$2.25
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
Feasibility Study for the Implementation of Nastran on the Illiac 4 Parallel Processor.
E. I. Field. 1975, 75p NASA-CR-132702
Contract NAS1-12436
Subm-Prepared for Universal Anal., Inc., Playa Del Rey, Calif.

Descriptors: *Computer programs, *Dynamic structural analysis, *Matrix methods, *Parallel processing (Computers), Feasibility analysis, Finite element method, Multiprocessing (Computers), Performance prediction.

For abstract, see STAR 1321

N75-30605/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Side Cracked Plated Subject to Combined Direct and Bending Forces.
J. E. Srawley, and B. Gross. 1975, 21p NASA-TM-X-71784, E-8446
Conf-Presented at the 9TH Symp. On Fracture Mech., Pittsburgh, 25-27 Aug. 1975; Sponsored by the AM. Soc. For Testing and Mater.

Descriptors: *Bending moments, *Crack propagation, *Plates (Structural members), *Stress concentration, Fatigue life, Fracture strength, Numerical analysis, Stress corrosion cracking.

For abstract, see STAR 1321

N75-30608/4GA PC$3.25/MF$2.25
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Measurement of Sound and Vibration Attuenuation in Steel Plates, Bare and with Glued Damper.
L. X. Nepomuceno. 1 Mar 75, 12p REPT-7503.769
In Portuguese; English Summary.

Descriptors: *Acoustic attenuation, *Acoustic measurements, *Steels, Flat plates, Graphs (Charts), Vibration damping.

For abstract, see STAR 1321

ORNL-5044(Vol.2) PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.
Stress Analyses of Flat Plates with Attached Nozzles. Vol. 2: Experimental Stress Analyses of a Flat Plate with One Nozzle Attached.
R. L. Battiste, W. H. Peters, W. F. Ranson, and W. F. Swinson. Jul 75, 124p
Contract W-7405-eng-26

Descriptors: (*Plates, *Stress analysis), (*Nozzles, Stress analysis), (*Pressure vessels, Stress analysis).

For abstract, see NSA 32 08, number 19532.

20L. Solid-State Physics

AD-A015 693/5GA PC$5.25/MF$2.25
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Improved Methods for Preparing Materials for Magnetic and Magneto-Optic Applications.
Final rept.
Sep 75, 112p
Contract N00014-67-A-0097-0019

Descriptors: *Magnetic materials, *Garnet, *Vanadates, *Crystal growth, Iron compounds, Rare earth compounds, Crystal structure, Vapor deposition, Neodymium compounds, Dysprosium compounds, Yttrium compounds, Yttrium iron garnet, Synthesis(Chemistry), Fluxes(Fusion), Optical properties, Sulfur compounds, Gallium compounds, Aluminum compounds, Selenium compounds, Magnetooptics.

A number of new techniques have been tried to improve methods for preparing various materials for magnetic and magneto-optic application. First, a high-pressure autoclave system has been developed that is capable of achieving temperatures of 1350C and pressures of 1500 atm, conditions which have not been previously obtainable. Experiments were carried out to optimize conditions for growth of rare-earth garnets from various types of fluxes. Second, a number of experiments were performed to explore the possibilities of using a vapor transport technique in synthesizing compounds containing rare earth, such as Nd, Dy, and Y with sulphur of selenium and gallium or aluminum. Third, new iron-free garnets, Na2ErMg2V3O12, have been obtained by slow cooling flux techniques using sodium vanadate as a solvent.

AD-A015 696/8GA PC$3.75/MF$2.25
Pennsylvania State Univ University Park Applied Research Lab
Temperature Dependence of the Electric Conductivity of Silver-Silicon Monoxide Superlattices.
Technical memo.,
Roderic L. Osgood. 12 Aug 74, 36p Rept no. TM-74-236
Contract N00017-73-C-1418
Master's thesis.

Descriptors: *Silicon compounds, *Silver, *Electrical conductivity, *Thermal switches, Monoxides, Temperature, Electrical resistivity, Switching circuits, Thin films, Substrates, Vapor deposition, Theses.
Identifiers: Superlattices, Silicon monoxide.

The dc resistance of synthetic silver-silicon monoxide superlattice structures has been measured as a function of temperature in the range from 77K to 300K. A new type of switching was discovered in which the electrical resistance changes abruptly from the room temperature value to a lower value at some threshold temperature. When the temperature is increased again, the sample switches at a high threshold temperature to a resistance value larger than the room temperature value, this higher value was found not to be stable; it decayed to the room temperature value within several hours. The identity period of the samples investigated ranged from about 20A to 300A. Each switching sample could be repeatedly and reproducibly cycled many times.

AD-A015 697/6GA PC$3.75/MF$2.25
North Carolina State Univ Raleigh Dept of Electrical Engineering
Theoretical Search for Super-Velocity Semiconductors.
Annual technical rept. Jun 74-Jun 75,
M. A. Littlejohn. Sep 75, 30p
Contract N00014-70-A-0120-0004
See also Annual rept. dated Mar 74, AD-778 702.

Descriptors: *Semiconductors, *Semiconducting films, *Crystal growth, *Electron transport, Electrical properties, Monte Carlo method, Vapor deposition, Mass spectroscopy, Impurities, Energy gap, Decomposition, Organometallic compounds, Gallium compounds, Nitrides, Electron mobility.
Identifiers: *Gallium nitrides, High field semiconductors, Chemical vapor deposition, Gallium/amino-triethyl.

This report describes work in two different areas. First of all, the progress made toward the synthesis of GaN thin films from chemical vapor deposition using the organometallic triethylgallium monamine (Ga(C2H5)3.NH3) is described. Electrical properties, mass spectrometry measurements, and surface ion mass spectrometry (SIMS) measurements are reported. Also, a discussion is given of a Monte Carlo calculation of the high field transport properties of GaN. This represents an effort toward developing a general Monte Carlo computer program for calculating the high field behavior of materials which offer the possibility for achieving high saturated drift velocities.

AD-A015 779/2GA PC$3.25/MF$2.25
Wayne State Univ Detroit Mich Dept of Physics

Magnetoacoustic Quantum Oscillation Studies in Gallium at 9 GHz,
N. Tepley, N. K. Batra, and R. L. Thomas. 29 Oct 74, 6p AFOSR-TR-75-1451
Grants AF-AFOSR-1965-77, NSF-GP-17683
Availability: Pub. in Jnl. of Physics, F. Metal Physics, v5 p1130-1134 Jun 75.

Descriptors: *Wave propagation, X band, Ultrasonics, Magnetic fields, Gallium, Single crystals, Shear stresses, Secondary waves, Acoustic waves, Attenuation, Oscillation, Transitions, Fermi surfaces, Reprints.
Identifiers: *Magnetoacoustics, Landau levels, Quantum oscillations.

The authors report their observation of the giant quantum oscillations in the attenuation of 9 GHz shear waves propagated along the b axis in a single crystal of gallium. It is suggested that these oscillations may arise from delta n = + or - 1 inter level Landau transitions and the dominant periods reported are due to nonextremal Fermi surface cross sections.

AD-A015 825/3GA PC$4.75/MF$2.25
University of Southern California Los Angeles Electronic Sciences Lab
Consolidated Semiannual Progress Report No. 21, Covering Research Activity During the Period 1 October 1974 through 1 April 1975.
Apr 75, 99p
Contract F44620-71-C-0067
See also report dated Oct 74, AD-A012 961.

Descriptors: *Scientific research, Solid state physics, Electronics, Communication and radio systems, Computers, Metals, Alloys, Lasers, Semiconductors, Cryogenics, Semiconductor devices, Plasmas(Physics), Control systems.
Identifiers: Automata theory.

Contents: Solid state--(Materials and semiconductors, Solid state devices, Metals, alloys and low temperature physics); Quantum electronics; Electrical engineering systems and information sciences--(Control systems, Communications and information sciences, Computer systems and automata theory); Electromagnetics and plasmas.

AD-A015 875/8GA PC$3.75/MF$2.25
Chicago Univ Ill Div of Physical Sciences
Experimental Investigation of the Electronic Properties of Solids.
Final rept. 1 Jan 71-30 Jun 75,
H. Fritzsche. Sep 75, 25p AFOSR-TR-75-1417
Contract F44620-71-C-0025

Descriptors: *Semiconductors, *Amorphous materials, *Electronic states, Transport properties, Solids, Photons, Surface properties, Synchrotrons, Scaling factors, Tunneling(Electronics).
Identifiers: *Amorphous semiconductors.

The core state and interband optical transitions and scaling laws relating these in different material systems are studied at high photon energies and with intense synchrotron radaition to aid material development. The electronic states, transport processes, contact and surface properties, the internal stress, and photoinduced structural changes of amorphous semiconductors are investigated to characterize and understand electronic processes in noncrystalline systems and amorphouse semiconductor devices. (Author)

AD-A016 124/0GA PC$3.25/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
Persistent Currents in Sodium Cholate.
Progress rept.,
Solomon Goldfein. Sep 75, 14p Rept no. USAMERDC-01901-24-PMMR

Descriptors: *Superconductivity, *Organic compounds, Sodium compounds, Transition temperature, Synthesis(Chemistry), Magnetic properties, Molecular structure.
Identifiers: *Organic superconductors, Cholic acid/sodium salt, Squid devices.

The object of this work was to obtain experimental evidence that sodium cholate had superconducting properties. It was tested by means of a Superconducting Susceptometer which is described as a thin film superconducting magnetometer (SQUID). The material was tested and found capable of carrying an indefinitely persistent current over macroscopic distances at temperatures ranging from 4-30K. The magnetic susceptibility was measured from 24-36K at 0.5K intervals and a discontinuity was found between 28 and 30K with a peak at 29K. The material is however, a bulk insulator. When this evidence is considered in the light of similar findings by tests performed by the Schwawlow and Devlin frequency change method relationships previously found for (T sub c) vs e/a, (T sub c) vs 1/the square root of M (the isotope effect), (T sub c) vs (theta sub d), and the discontinuity found at 30K on a (c sub p) vs T curve the evidence for presence of superconductivity is very strong. The high resistence could possibly be attributed to a low concentration of conduction electrons coupled with an off center position of the sodium ion when considered in relation to the GL sandwich theory.

AD-A016 170/3GA PC$3.25/MF$2.25
King'S Coll London (England) Dept of Physics
Critical Behavior in Many Body Systems.
Final rept. Oct 74-Oct 75,
C. Domb. Sep 75, 13p
Grant DAERO-75-G-0028

Descriptors: *Ferromagnetism, Mathematical models, Free energy, Specific heat, Polymers.
Identifiers: *Ising model, Ising ferromagnets, Potts model, *Phase transitions, Intermolecular structure.

Earlier studies of the simple Ising model have been extended and the techniques applied to a variety of multistate and multispin models. Briefly presented is the authors' research results in which they have developed methods for the derivation of series developments for the Potts model, for which one of the most interesting questions is the order of the transition, for Ising models with four-spin interactions (including the eight-vertex model) and the three-spin triangular Ising model. For the three-spin triangular Ising model it has been found possible to conjecture the exact form of the spontaneous magnetisation. They have also continued to study the general cluster expansion for the high temperature specific heat of the Ising model of a ferromagnet. High field expansions have been derived for the Ising model on the hydrogen peroxide lattice. The exploration of the size and shape of polymer chains using insight gained from critical phenomena has continued.

AD-A016 178/6GA PC$3.25/MF$2.25
California Univ Santa Barbara
Time Dependent Superconductivity and Superconducting Quantum Electronics.
Final rept. 20 Dec 71-19 Jul 75,
D. J. Scalapino. 26 Sep 75, 11p ARO-10409.13-P
Grant DA-ARO-D-31-124-72-G74

Descriptors: *Superconductivity, *Josephson junctions, Scientific research.
Identifiers: Elementary excitations.

The report briefly describes the author's research on time-dependent superconductivity: fluctuations in Josephson junctions and point contacts, current flow across normal-superconducting interfaces, transport properties in laser irradiated superconductors, and superconductivity in granular arrays. This report also includes some comments concerning a new area of research which was explored: highly anisotropic materials.

BNL-20261 PC$4.00/MF$2.25
Bell Labs., Murray Hill, N.J.
Stopping of Fast Channeled Particles.
J. A. Golovchenko. 1973, 11p

Descriptors: (*Crystals, *Charged-particle transport), (*Ions, *Slowing-down), Impact parameter, Ion channeling.

For abstract, see NSA 32 08, number 21337.

CALT-822-74 PC$4.75/MF$2.25
California Inst. of Tech., Pasadena.
On the Critical Temperature of Superconductors.
S. J. Poon. Jun 75, 33p
Contract AT(04-3)-822

Descriptors: (*Superconductors, *Transition temperature), Alloys, Energy gap, Tunnel effect.

For abstract, see NSA 32 08, number 21040.

COM-75-50564/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Superconducting Properties of A15 Phase V-Ir Alloys.
Final rept.,
J. E. Cox, J. Bostock, and R. M. Waterstrat. 1974, 5p
Pub. in Proceedings of International Conference on Low Temperature Physics-LT 13 (13th), Boulder, Colo., 21-25 Aug 72, v3 p480-484 1974.

Descriptors: *Vanadium alloys, *Iridium alloys, *Superconductivity, Transition temperature, Phase transformations.
Identifiers: Reprints.

Superconducting transition temperatures, T sub 0, and initial slopes of the critical magnetic field curves have been determined for A15 phase V-Ir alloys. Samples investigated range from V(61)Ir(39) to V(75)Ir(25) in 2 at. % steps. Low temperature ordering anneals do not markedly affect the superconducting properties of these alloys. Metallurgical aspects of these materials are discussed.

COO-2456-11 PC$4.00/MF$2.25
Columbia Univ., New York.
Physical and Numerical Dissipation and Dispersion in Viscous Compressible Flow Computation.
C. K. Chu. 1975, 20p CONF-750352-1
Contract AT(11-1)-2456

Descriptors: (*Magnetohydrodynamics, *Compressible flow), Finite difference method, Hydrodynamics, Navier-stokes equation, Numerical solution, Steady flow, Time dependence, Unsteady flow, Viscous flow.

For abstract, see NSA 32 08, number 21041.

COO-3150-25 PC$4.00/MF$2.25
Cornell Univ., Ithaca, N.Y. Lab. of Atomic and Solid State Physics.
Observations on the Determination of Electron Mean-Free Paths from RF Size Effect Measurements.
D. K. Wagner, and R. Cochran. Jun 74, 13p
Contract AT-(11-1)-3150

Descriptors: (*Electrons, *Mean free path), (*Potassium, *Charged-particle transport), Errors, Plates, Radiowave radiation, Resonance, Size.

For abstract, see NSA 32 08, number 21340.

N75-30877/5GA PC$3.75
Laboratoire de Biophysique, Paris (France).
Mesomorphic Materials Used as Phonon Sensitive Surfaces for Real Time Hologram Restitution Etude des Mesomorphes Pouvant Servir de Surfaces Phonosensibles dans la Reconstitution d'Hologrammes en Temps Reel.
Final Report.
J. Perrin, A. Dmitrief, B. Richard, and W. Urbach. Oct 74, 50p
Contract DGRST-72-7-0118
Language in French.

Descriptors: *Acoustical holography, *Liquid crystals, *Real time operation, Birefringence, Computerized simulation, Electric fields, Electro-optics, Magnetic flux, Matrices (Circuits), Switching circuits.

For abstract, see STAR 1321

ORO-2911-17 PC$6.75/MF$2.25
Virginia Univ., Charlottesville School of Engineering and Applied Science.
Interaction of Heavy Ions with Matter.
J. W. Boring, and R. E. Johnson. Jun 75, 73p
Contract AT(40-1)-2911

Descriptors: (*Rna-ase, *Charged-particle transport), (*Hydrogen ions, *Collisions), (*Helium ions, Collisions), (*Copper, Charged-particle transport), Ion collisions, Nitrogen, Stopping power.

For abstract, see NSA 32 08, number 21341.

SAND-75-0005 PC$5.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Absolute Determination of Bremsstrahlung Deposition (Hydra).
G. J. Lockwood, and G. H. Miller. Jun 75, 46p
Contract AT(29-1)-789

Descriptors: (*Electron beams, *Energy losses), (*Calorimetric dosemeters, *Errors), (*Gold, *Charged-particle transport), (*Aluminium, Charged-particle transport), Bremsstrahlung, Energy absorption.

For abstract, see NSA 32 08, number 21342.

SFB-MHD-17 PC$5.25/MF$2.25
Technische Univ. Berlin (F.R. Germany). Sonderforschungsbereich Magnetohydrodynamik.
Stabilization of Free Conducting Layers by a Transverse Magnetic Field.
P. Plaschko. Dec 74, 43p
In German. U.S. Sales Only.

Descriptors: (*Magnetohydrodynamics, *Disturbances), (*Mhd generators, *Stability), Boundary conditions, Eigenvalues, Layers, Magnetic fields, Stabilization, Two-dimensional calculations, Velocity, Vortices.

For abstract, see NSA 32 08, number 21043.

20M. Thermodynamics

AD-A015 863/4GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Materials Sciences Lab
Particle Emission and Related Morphological Changes Occurring during the Sublimation of Graphitic Carbons.
Interim rept.,
A. Greenville Whittaker, and P. L. Kintner. 15 Jul 75, 44p Rept no. TR-0076(6950-07)-2 SAMSO-TR-75-188
Contract F04701-75-C-0076

Descriptors: *Ablation, *Graphited materials, *Carbon compounds, High temperature, Particles, Emission, Pyrolytic graphite, Oxidizers, Vaporization, Thermochemistry, Particle spectra, Detectors, Argon, Morphology.
Identifiers: Tyndall effect, *Graphitic carbons, Glassy carbon.

The mechanism of particle emission from hot graphitic carbons was studied by means of several heating and detection methods and by analysis of the emitted particles. The carbons studied are ATJS, Graph-I-Tite G, POCO9Q, spectrographic rod, pyrolytic graphite, and glassy carbon. All showed particulated mass loss in the range of 60 to 90% of the total mass loss. Generally, the results of this research are in accord with the conclusions of other investigators in that the mechanism of particulate mass loss for two-phase carbons is due mainly to preferential vaporization of the binder and the bursting of closed pores by entrapped gas. For single-phase carbons, the mechanism appears to involve undercutting resulting from inhomogeneities and the bursting of closed pores. Some of the graphitic material was transformed into linear carbon polymorphs, i.e., chaoite, carbon VI, and alpha + beta carbyne, and was emitted along with the graphitic particles. Data are cited that indicate that at approximately 3750 K particulate mass loss changes to mass loss as a result of the formation of liquid carbon.

BNL-20155 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Recent Experiments on the Surface of Liquid exp 4 He: Elastic Scattering of exp 4 He Atoms.
D. O. Edwards, P. P. Fatouros, G. G. Ihas, P. Mrozinski, and S. Y. Shen. 1975, 19p CONF-750130-1

Descriptors: (*Helium 4, *Atom-atom collisions), (*Helium i, Atom-atom collisions), Elastic scattering, Helium 3, Sound waves, Surface tension, Velocity.

For abstract, see NSA 32 08, number 21031.

N75-30236/4GA PC$10.50/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of Convective Heating Tests of a Longitudinal GAP on the Rockwell Flat Plate Model (15-0, Insert 7) in the NASA/Ames Research Center.
M. Quan, and W. K. Lockman. Jul 75, 414p
NASA-CR-141539, DMS-DR-2250
Contract NAS9-13247

Descriptors: *Convective heat transfer, *Flat plates, *Hypersonic wind tunnels, *Tables (Data), Mach number, Reynolds number, Thermocouples, Wind tunnel models.

For abstract, see STAR 1321

N75-30483/2GA PC$4.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
Thermal Network Modelling Handbook.
Jan 72, 92p NASA-CR-144418, TRW-14690-H003-RO-00
Contract NAS9-10435

Descriptors: *Conductive heat transfer, *Manuals, *Mathematical models, *Thermal energy, Energy sources, Network analysis, Numerical analysis, User requirements.

For abstract, see STAR 1321

20N. Wave Propagation

AD-A015 826/1GA PC$5.25/MF$2.25
Bdm Corp Albuquerque N Mex
Solution of Thin-Wire Moments Problems by Banded Matrix Iteration.
Quarterly technical rept. no. 4, 2 Jan-1 Apr 75,
T. R. Ferguson. Jul 75, 101p Rept no. BDM/A-50-75-TR RADC-TR-75-189
Contract F30602-74-C-0182

Descriptors: *Electromagnetic compatibility, Iterations, Far field, Linear algebraic equations, Matrices(Mathematics), Antennas.
Identifiers: Method of moments.

An extensive number of examples where banded matrix iteration techniques were used as the solution algorithm in the method of moments are presented. The antenna examples solved using the banded matrix solution technique include: helix, rhombic, long crossed wires, parallel wires, collinear wires, linear array dipoles, circular array dipoles and wire grids. Preliminary guides for segment numbering as used in the banded matrix technique are also presented.

AD-A016 003/6GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Applied Research Lab
Short-Wavelength Acoustic Diffraction by Prolate Spheroids,
Gerald C. Lauchle. 10 Mar 75, 8p
Availability: Pub. in Jnl. of the Acoustical Society of America, v58 n3 p568-575 Sep 75.

Descriptors: *Acoustic waves, Diffraction, Scattering, Rayleigh scattering, Spheres, Cross sections, Wavelengths, Reprints.
Identifiers: Spheroids.

The scattering of a plane acoustic wave by a rigid prolate spheroid of large fineness ratio is investigated analytically. The solution for the diffracted field is presented in terms of the classic modal series of spheroidal harmonics. The series are numerically evaluated for wavelengths much smaller than the length of the spheroid, but comparable to the minor radius. For this range of wavenumbers, use was made of available asymptotic formulas of the spheroidal wave functions, where the convergence of the double infinite series is discussed in terms of the value of the product of wavenumber and various characteristic lengths of the spheroid. The directivity functions are presented for several values of plane-wave incidence, reduced frequency, and fineness ratio. The total scattering cross section is evaluated and compared to the scattering cross section of rigid spheres. An estimate is given to the size sphere required to scatter approximately the same power as the spheroid of given size and orientation with respect to the incoming plane wave. (Author)

AD-A016 102/6GA PC$3.25/MF$2.25
Wisconsin Univ Madison Mathematics Research Center
An Inverse Scattering Transform for Wave-Wave Scattering.
Technical summary rept.,
Flora Y. F. Chu, and Alwyn C. Scott. Jun 75, 25p
Rept no. MRC-TSR-1524
Contract DA-31-124-ARO-D-462, Grant NSF-GK-37552

Descriptors: *Laser beams, *Electromagnetic scattering, Wave equations, Nonlinear differential equations, Plasma medium, Plane waves, Numerical analysis, Integral transforms.
Identifiers: *Inverse scattering, Wave wave interactions, Brillouin scattering, Raman scattering, Solitons.

An inverse scattering transform method is outlined for the resonant interaction of two plane waves (an incident wave of amplitude (A sub 1) and radian frequency (Omega sub 1) and a scattered wave of amplitude (A sub 2) and frequency (Omega sub 2) with a medium which can

propagate a classical scattering waves (of amplitude Y and frequency (Omega sub 3). The inverse scattering transform method can be veiwed as a nonlinear generalization of the Fourier transform method, and, in the form presented here, it describes the dynamics of the scattering medium Y(x,t). The results can be applied to a variety of physical problems including: (1) Raman and Brillouin scattering of laser light, (2) electromagnetic wave-wave interactions in a plasma, and (3) the distributed parametric amplifier.

AD-A016 167/9GA PC$3.75/MF$2.25
Harry Diamond Labs Adelphi Md
Technique for Absolute Measurement of Noise Power at All Radio Frequencies.
Technical rept.,
Abraham Singer, and Jan M. Minkowski. Mar 75, 31p Rept no. HDL-TR-1671

Descriptors: *Noise(Electrical and electromagnetic), Measurement, Power, Radiofrequency, Noise, Temperature.

A method and system for absolute measurement of noise power is described. The method is valid at all radio frequencies but is particularly useful above 65 GHz where no other means for making such measurements currently exists. In addition, it has the important advantages of relative simplicity and reliability.

AD-A016 204/0GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Dept of Physics
Virtual Excitation Type Surface Polaritons on Anisotropic Media.
Technical rept.,
A. Hartstein, E. Burstein, J. J. Brion, and R. F. Wallis. 5 Feb 73, 6p Rept no. TR-60
Availability: Pub. in Solid State Communications, v12 p1083-1086 1973.

Descriptors: *Photons, Coupling(Interaction), Anisotropy, Surface properties, Excitation, Polarization, Quartz, Maxwells equations, Reprints.
Identifiers: Alpha quartz, Surface polaritons.

We discuss the nature of a new type of surface polariton which occurs on anisotropic media, involving a photon coupled to a surface virtual excitation. Dispersion curves are calculated for alpha-quartz, where both real excitation type and virtual excitation type surface polaritons are predicted. The dispersion curves for virtual excitation surface polaritons are found to remain at small wavevector, and the endpoints of the dispersion curves terminate on the bulk polariton dispersion curves in the two media. The virtual excitation surface polaritons which occur on gyromagnetic and gyrodielectric media are also noted. (Author)

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A015 708/1GA PC$5.25/MF$2.25
General Applied Science Labs Inc Westbury N Y
An Experimental Combustion and Flame Stabilization Study of Dump Burners,
Stephen N. Schmotolocha, and Constantino Economos. Sep 75, 106p Rept no. GASL-TR-792 AFOSR-TR-75-1446
Contract F44620-71-C-0014

Descriptors: *Air breathing engines, *Combustors, *Combustion, Flammability, Mixing, Fuel injection, Air flow, Ignition, Flame holders.
Identifiers: *Dump burners, JP-4 fuel.

An experimental investigation of the mixing, flammability and combustion mechanisms of dump burners was conducted. Tests were carried out with a 9:1 expansion area coaxial configuration at atmospheric burner pressure, and over a wide spectrum of air velocity, air temperature and fuel/air ratio. Liquid JP-4 was injected normal to the airstream through eight orifices located in the inlet wall upstream of the burner. The effects of air flow conditions, fuel injection location, global equivalence ratio, and secondary hot and cold oxidizer injections on mixing, ignition, blow-out flameholder base region and combustor performances were studied.

AD-A015 744/6GA PC$5.25/MF$2.25
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
A Smoke Detection System for Manned Spacecraft Applications.
Final rept. Jul 70-Jul 74,
Terry M. Trumble. Jun 75, 108p Rept no. AFAPL-TR-74-97

Descriptors: *Smoke, *Optical detectors, *Manned spacecraft, *Optical equipment, *Fire safety, Fire alarm systems, Light scattering, Particles, Distribution, Signal processing, Analog to digital converters, Photomultiplier tubes, Preamplifiers, Logarithmic amplifiers, Waveforms, Light transmission, Space crews, Human factors engineering, Space stations, Aircraft fires, Fire prevention, Fire safety, Fire resistant materials, Acceleration tolerance, Particle size, Pressure, Temperature, Space environments, Electronic equipment, Measurement, Phototubes, Calibration, Theses.
Identifiers: *Smoke detectors, MTBF(Mean time between failure), Mean time between failure.

This report describes the development, from concept to hardware, of an open path optical system for detecting smoke in manned spacecraft. Studies were conducted on the nature of light scattering through smoke as well as the nature of the particle statistics in smoke. These studies resulted in the selection of the 2537A wavelength for smoke detection and the use of the 2537A/3129A ratio for discrimination from background particulates. Test results on the first laboratory unit constructed are included, and indicate that the concept is feasible and practicable. Present programs in this area are discussed in the Summary and Conclusions section of this report. (Author)

AD-A015 899/8GA PC$3.75/MF$2.25
Stanford Research Inst Menlo Park Calif
Solid Propellant Kinetics. V. Fuel-Oxidizer Reaction Rates from Heterogeneous Opposed Flow Diffusion Flame.
Interim rept.,
C. M. Ablow, and H. Wise. Dec 74, 37p
Contract N00014-70-C-0155
See also AD-773 117.

Descriptors: *Solid rocket propellants, *Ammonium perchlorate, *Combustion, Composite propellants, Burning rate, Reaction kinetics, Gas dynamics, Flames.

A theoretical model is presented relating the gas dynamics and chemical kinetics of the opposed flow diffusion flame formed in the stagnation region between two opposing streams of gaseous reactants, one originating from the surface of a subliming solid, such as ammonium perchlorate. At low gas flows the regression rate of the solid is controlled by the physical properties of the system, including the net heat of gasification, the heat of combustion, and the transport parameters. At high gas flows a limiting solid regression rate is attained due to reaction-rate limitations that cause incomplete combustion of the reactants. The theoretical model developed for the heterogeneous opposed flow diffusion flame allows interpretation of the limit in solid regression rates in terms of global reaction kinetics.

AD-A015 953/3GA PC$4.75/MF$2.25
Naval Academy Annapolis Md
The Ignition of Liquid Propellants by Acoustic Cavitation.
Research rept.,
Mark S,. Campagna. 23 May 75, 99p Rept no. USNA-TSPR-65
Report on a Trident Scholar Project.

Descriptors: *Monopropellants, *Ignition, *Acoustics, *Cavitation, *Liquid gun propellants, Guns, Acoustic horns, Transducers, Ultrasonics, Interior ballistics, Combustion.
Identifiers: Acoustic cavitation.

The subject of this report is the ignition of a liquid monopropellant by acoustic cavitation. An experimental result of this study was the successful preliminary ignition of the monopropellant by an acoustic horn-transducer assembly. Upon examination of these ignition results, it was postulated that the reaction initiated by the acoustic device would definitely result in combustion of the monopropellant under proper pressure conditions. The proceedings of the experiment is described. The writer concluded: 1. The ignition of liquid monopropellant is possible using acoustic techniques under proper conditions; 2. A value for the minimum energy density necessary to initiate the combustion sequence of the liquid monopropellant has been obtained; 3. The acoustic cavitation ignition technique is a precise, simply, and efficient method, however writer suggests more experiment for further development. (Author)

AD-A016 063/0GA PC$3.75/MF$2.25
California Univ Irvine Combustion Lab
Mechanisms of Exhaust Pollutants and Plume Formation in Continuous Combustion.
Interim rept. 1 May 74-28 Feb 75,
G. S. Samuelsen, and R. E. Peck. May 75, 27p Rept no. UCI-ARTR-75-2 AFOSR-TR-75-1288
Grant AF-AFOSR-2710-74

Descriptors: *Exhaust gases, *Plumes, *Combustion, Gas turbines, Scientific research, Air pollution.

The investigation of exhaust pollutant and plume formation in continuous combustion is a combined analytical and experimental study of turbulent, backmixed combustion in gas turbines. Experiments are being conducted operating with premixed methane/air and propane/air reactants. Theoretically predicted profiles of the flow properties are being systematically compared with experimentally determined profiles. The report discusses the following research: The experimental facility has been modified and updated to accomodate the current study; limited emission and velocity data have been obtained; and the analytical phase has been directed to updating the turbulence model used in the original (PISTEP I) ORC numerical program and adapting a p-v, 3-dimensional program dubbed TEACH to the ORC system.

AD-A016 064/8GA PC$4.25/MF$2.25
Brigham Young Univ Provo Utah Coll of Engineering Sciences and Technology
Research on Non-Steady Combustion and Extinguishment.
Final rept.,
Howard S. Heaton, Ralph L. Coates, and M. Duane Horton. May 75, 70p AFOSR-TR-75-1362
Grant AF-AFOSR-1895-70

Descriptors: *Solid rocket propellants, *Combustion stability, Burning rate, Acoustic properties, Flames, Interior ballistics, Computer applications.
Identifiers: T burners.

Experimental and theoretical studies were carried out on acoustic instability during com-

bustion of solid propellants. The objective of the experimental tests was to find a set of three parameters, Eg, Es, Ts for a new theoretical model which would consistently correlate experimental data. Tests of burning rate, flame temperature, L*-instability, and T-burner instability were run for five different propellants and the three parameters were determined. A correlation of the theoretical model with the experimental data was made and the results were reasonably good and better than previous correlations. A previously developed non-linear computer model of the T-burner was extended to allow high amplitude pressure oscillations and damping from heat transfer and fluid friction. Significant pressure wave steepening was found with high amplitude oscillations. Momentum loss out the vent was found to be the dominant damping effect.

COM-75-50574/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A Radiative Ignition Model of a Solid Fuel.
Final rept.,
Takashi Kashiwagi. 1974, 12p
Pub. in Combustion Science and Technology, v8 p225-236 1974.

Descriptors: *Ignition, *Solid fuels, Mathematical models, Finite element analysis.
Identifiers: Reprints.

A theoretical model describing radiative ignition of a solid fuel is constructed and is numerically analyzed. The model includes the effects of gas phase reaction and a finite value of the absorption coefficient of the solid (in-depth absorption of incident radiation). It is found that the gas phase reaction must be included in the model in order to understand radiative ignition of a solid fuel and to find its ignition boundary. The in-depth absorption of the incident radiation by a solid fuel significantly affects the ignition delay time. The results indicate that there is a finite range of values for pyrolysis or gas phase reaction activation energy for which ignition will occur. This finding has a direct bearing on efforts to reduce material ignitability.

N75-30274/5GA PC$3.75/MF$2.25
Rocketdyne, Canoga Park, Calif.
Further Analysis of the Effects of Baffles on Combustion Instability.
Final Report.
C. L. Oberg, and M. D. Schuman. Jun 75, 32p NASA-CR-134832
Contract NAS3-17821

Descriptors: *Baffles, *Combustion chambers, *Combustion stability, *Computer techniques, Acoustics, Models, Prediction analysis techniques, Traveling waves.

For abstract, see STAR 1321

N75-30278/6GA PC$3.75/MF$2.25
Pennsylvania State Univ., University Park. Dept. of Mechanical Engineering.
Investigation of Critical Burning of Fuel Droplets.
Semiannual Report, 1 Jan. - 30 Jun. 1975.
G. M. Faeth, and S. Chanin. Jul 75, 36p NASA-CR-143385
Contract NGR-39-009-077

Descriptors: *Combustion stability, *Drops (Liquids), *Liquid rocket propellants, Engine design, High pressure, High temperature.

For abstract, see STAR 1321

N75-30280/2GA PC$3.75/MF$2.25
Witwatersrand Univ., Johannesburg (South Africa). School of Mechanical Engineering.
The Spherical Bomb Method for Laminar Burning Velocity Determination: Equations for Thick Flame Propagation.
A. M. Garforth, and C. J. Rallis. May 75, 45p
ISBN-0-85494-312-9, REPT-59

Descriptors: *Bombs (Ordnance), *Flame propagation, Burning rate, Gas mixtures, Laminar flow, Methane, Rigid structures, Spheres, Temperature profiles.

For abstract, see STAR 1321

21C. Electric Propulsion

N75-30248/9GA PC$4.25/MF$2.25
Colorado State Univ., Fort Collins. Dept. of Mechanical Engineering.
Experimental Investigations of Argon and Xenon Ion Sources.
Annual Report, 1 Jul. 1974 - 30 Jun. 1975.
H. R. Kaufman. Jun 75, 72p NASA-CR-134845
Grant NSG-3011

Descriptors: *Argon, *Electrostatic engines, *Ion sources, *Xenon, Ion pumps, Propellants, Vacuum apparatus.

For abstract, see STAR 1321

21D. Fuels

AD-A015 616/6GA PC$3.75/MF$2.25
Army Construction Engineering Research Lab Champaign Ill
Technical Evaluation Study: Solid Waste Heat Reclamation at Philadelphia Naval Shipyard, Philadelphia, Pa.
Technical rept.,
H. G. Rigo. May 74, 45p Rept no. CERL-TR-E-48

Descriptors: *Solid wastes, *Fuels, Reclamation, *Incinerators, *Boilers, Waste disposal, Naval shore facilities, Garbage, Cost analysis, Waste treatment.
Identifiers: *Waste recycling, *Solid waste disposal, Refuse disposal, Heat recovery, Waste heat boilers, Philadelphia Naval Shipyard, Design.

This study was conducted to evaluate the solid waste disposal problems and to ascertain the economic and technical feasibility of solid waste heat reclamation incineration at Philadelphia Naval Shipyard, Philadelphia, PA. An analysis of the solid waste stream was performed, applicable standards were evaluated, and a technology review of cost/performance characteristics of current solid waste heat reclamation units, including processing of solid wastes and burning in existing boilers, was conducted. Recommendations were based on facility benefit-to-cost ratio considerations and operation success probabilities. It was found that steam generation through waste heat reclamation, by incineration or processing and using the refuse as a fuel in an existing boiler, was both technically and economically feasible. The latter method has the highest benefit-to-cost ratio (Alternative methods of disposing of on-base generated solid waste are also suggested.

AD-A016 156/2GA PC$4.75/MF$2.25
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
Direct Utilization of Crude Oils as Fuels in U.S. Army Diesel Engines,
E. C. Owens, and E. A. Frame. Jun 75, 89p Rept no. AFLRL-66
Contract DAAK02-73-C-0221

Descriptors: *Diesel engines, *Diesel fuels, *Oils, Fuel systems, Fuel pumps, Fuel filters, Viscosity, Wear.
Identifiers: *Crude oil, *Pour point.

Crude oils with a wide range of properties were investigated for direct use as fuel in U.S. Army high-speed diesel engines. The distribution and availability of crude oil properties throughout the world were investigated, and these properties were divided into two groups (1) Those properties which would be of importance for short-term operational effects, and (2) Those properties whose effects would manifest during longer term operation. Effects of crude oil use on engine subsystem hardware such as fuel filters and fuel injection pumps were investigated, with particular attention being paid to the TCCS injection system. Performance and combustion data were determined using pre-cup and direct injection configurations of the single cylinder CLR diesel engine operating on various crude oils. Performance data, wear, and deposition effects of crude oil use were obtained using the TACOM single-cylinder diesel engine. Results of this investigation showed that a wide range of crude oils with proper selection and pretreatment are feasible emergency energy sources for U.S. Army four-cycle high-speed diesel engines.

AD-A016 157/0GA PC$3.75/MF$2.25
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
Universal Fuel Requirements,
J. N. Bowden, and W. W. Wimer. May 75, 42p
Rept no. AFLRL-67
Contract DAAK02-73-C-0221

Descriptors: *Jet engines, *Diesel engines, *Fuels, Fuel additives, Multifuel engines, Hydrocarbons, Flash point, Jet engine fuels, Diesel fuels, Mathematical models, Computer programming.
Identifiers: *Pour depressant.

To reduce the logistics problems of a mobile army, requirements for a fuel to operate satisfactorily in both diesel and turbine engines, in tropical as well as arctic climates, are suggested. The critical properties of fuels for turbine and diesel operation are examined. In the course of developing these suggested requirements, computer programs were formulated for blending hydrocarbon fractions with a base fuel to yield a f uel with desired properties for diesel and turbine operation. The effects of cetane improver and pour depressant additives on the characteristics of a 'universal fuel' are examined.

AD-A016 256/0GA PC$4.75/MF$2.25
Stevens Inst of Tech Hoboken N J Dept of Mechanical Engineering
Hydrogen Storage and Transfer.
Semiannual technical rept. 1 Feb-31 Jul 75,
R. B. Cole, R. S. Magee , and J. W. Hollenberg.
25 Aug 75, 89p Rept no. ME-RT-75008
Contract N00014-75-C-0220, ARPA Order-2615
See also Semi-annual rept. dated 28 Feb 75, AD/A-006 984.

Descriptors: *Hydrogen, *Fuels, Liquefied gases, Transfer, Storage, Pumping, Hydrides, Fire safety, Hazards, Pumps, Costs, Hydrogen embrittlement, Storage tanks, Cryogenics.
Identifiers: *Fuel storage, Liquefaction, Design, Hazardous materials spills, Liquid hydrogen.

Various modes of hydrogen storage are considered: compressed gas, liquid and solid (Hydride). Preliminary analysis of energy-storage densities and costs dictated more detailed consideration of hydrogen storage as a cryogenic liquid or metal hydride for (1) small-scale mobile storage and (2) large-scale stationary storage. Concentration was on these two modes in gathering and evaluating sufficient quantitative information to allow assessment of engineering problems and overall practicality. Liquid-hydrogen liquefaction, transfer and storage, and safety were explored. Liquid-cryogen pumping technology is reviewed with

particular concern for application to airborne pumping of liquid-hydrogen. Pump types and performance are examined and technical problems identified. An examination of the state-of-the-art of metallic-hydride hydrogen storage is examined.

N75-30163/0GA PC$10.25/MF$2.25
Lockheed-California Co., Burbank.
Study of the Application of Hydrogen Fuel to Long-Range Subsonic Transport Aircraft, Volume 2.
Final Report, Feb. - Oct. 1974.
G. D. Brewer, R. E. Morris, R. H. Lange, and J. W. Moore. Jan 75, 380p NASA-CR-132559, LR-26752-2
Contract NAS1-12972
Subm-Prepared in Cooperation with Lockheed-Georgia CO., Marietta, Ga.

Descriptors: *Aircraft fuels, *Liquid hydrogen, *Subsonic speed, *Transport aircraft, Aircraft noise, Aircraft safety, Costs, Exhaust gases.

For abstract, see STAR 1321

PAT-APPL-475 688/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
A Method for Reducing the Viscosity of Aluminum Gelled Fuels.
Patent Application,
Alan L. Woodman, and Arnold Adicoff. Filed 3 Jun 74, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Jet engine fuels, Patents, Amines, Fuel systems.
Identifiers: *Patent applications, *Gelled jet engine fuels, PAT-CL-44-7-E, *Degellation, JP-4 fuel, JP-5 fuel.

The patent application relates to a method for degelling gelled hydrocarbon fuels in order to produce a product which can be used in aircraft propulsion. Increased safety, in the case of an aircraft crash landing or crash, could be gained if the currently used liquid fuels were replaced by gelled fuels. It has now been found that the sensitivity of gelled fuels toward amines and alcohols--and especially amines--can be used to advantage in the field of aircraft propulsion. According to this invention, metered amounts of gelled JP-4 and JP-5 are subjected to metered amounts of certain amines and are thereby degelled just prior to injection into an aircraft engine for propulsion purposes. Certain alcohols can also be used but are less desirable than amines.

PAT-APPL-579 770/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Improved Demisting System for Cold Starts and Restarts.
Patent Application,
Arnold Adicoff. Filed 22 May 75, 7p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Thickeners(Materials), *Jet engine fuels, *Aluminum soaps, Patents, Fuel additives, Fatty acids.
Identifiers: *Patent applications, PAT-CL-260-448.

The patent application relates to compositions of matter comprising a mixture of a jet fuel and an aluminum di-acid soap of a saturated carboxylic acid having from 8 to 20 carbon atoms. This produces a thickened fuel.

PB-245 192/0GA PC$4.25/MF$2.25
Bureau of Mines, Dallas, Tex. Dallas Mineral Supply Field Office.
Sulfur Content of Crude Oils.
Information circular 71,
M. Carrales, Jr., and R. W. Martin. Aug 75, 66p BuMines-IC-8676

Descriptors: *Crude oil, *Sulfur, Energy supply, Classification, Composition(Property), United States, Africa, Canada, Middle East, Europe, Far East, Latin America, Tables(Data).

This Bureau of Mines report presents information pertaining to the sulfur content of crude oil produced during 1971 in the United States and in some foreign countries. These data are presented for fields in 26 States that accounted for about 76 percent of the U.S. oil production during 1971 and for fields in 24 foreign countries that accounted for about 64 percent of the total oil produced from these countries during the same year. The tabular data include the following items: geographical area or foreign country, field name, sulfur content, analysis number, geologic formation, geologic age, depth of formation, and 1971 oil production. Summary tables show the classification of U.S. and foreign crude oil production during 1971 by sulfur content. The objective of this report was to classify the 1971 crude oil production from U.S. and foreign fields, where crude oil analyses were available, according to sulfur content.

21E. Jet and Gas Turbine Engines

AD-A015 664/6GA PC$5.25/MF$2.25
Naval Sea Systems Command Washington D C
NAVSEA Gas Turbine Workshop Report and Recommendations.
Final rept.
Jul 75, 101p Rept no. NAVSEA-03221-1-76
Proceedings of Joint Industry-Navy Workshop on Gas Turbine for U. S. Navy Utilization, Annapolis, Md., 18-22 Mar 74.

Descriptors: *Gas turbines, Workshops(Meetings), Marine propulsion, Optimization, Surface effect ships, Hydrofoil craft, Destroyers, Naval equipment, Production, Costs, Hazards, Fuels.

This report covers the proceedings of a Navy sponsored joint industry-Navy workshop held at the Naval Ship Research and Development Center, Annapolis Laboratory, during March 18-22, 1974, on the subject of Gas Turbines for U.S. Navy utilization. The report catalogues each specific problem area discussed in the format of Problem, Goal, and Approach, each one of which becomes a separate building block for a total program pointed at reducing the problems associated with the use of Gas Turbines in the U.S. Navy. (Author)

AD-A015 688/5GA PC$3.75/MF$2.25
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
Research on Noise Generated by Ducted Air-Fuel Combustion Systems.
Annual rept. no. 4, Mar 74-Jul 75,
E. G. Plett, H. J. Shafer, and M. Summerfield. Aug 75, 47p
Contracts N00014-67-A-0150-0029, N00014-75-C-0507
See also Annual rept. no. 3, AD-785 028.

Descriptors: *Gas turbines, *Jet engine noise, Combustors, Ducted bodies, Combustion, Fuels, Air flow, Noise reduction.
Identifiers: *Combustion noise, *Noise generation, *Noise sources.

A two-pronged approach to the study of noise generation by combustion in a confined flow system, similar to a jet engine configuration, has been followed. One aspect deals with the mechanisms of noise generation by combustion; the other aspect deals with the effect of confinement on the noise generation and radiating properties of an unsteady combustion-duct-flow interaction. An experiment to evaluate the relative importance of several of the terms appearing in the theoretical formulation describing combustion noise sources has been developed.

AD-A016 266/9GA PC$7.00/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
Optimal Replacement Policy for the F-15 Aircraft Engine Modules.
Master's thesis,
James A. Forbes, and Phillip P. Wyatt. Aug 75, 192p Rept no. SLSR-7-75B

Descriptors: *Jet fighters, *Turbofan engines, *Replacement theory, Maintenance, Life expectancy, Costs, Life cycles, Computer programs, Theses, FORTRAN.
Identifiers: F-15 aircraft, F-100 engines, F-100-PW-100 engines, *Service life.

The F-100 engine, used on the F-15 aircraft, differs from previous engines in that it is modularized. Certain of the engine modules must be removed in order to perform maintenance on others. As an example, the fan module must be removed to repair the core module. If an unfailed module is removed to facilitate maintenance on another module, it may be worthwhile to replace the unfailed module rather than reinstall it. Such a replacement is termed opportunistic maintenance. The purpose of the study was to determine if an algorithm could be developed which would determine when opportunistic replacement is optimal and when it is not. An algorithm was developed and programmed in FORTRAN. Variables addressed include transportation, packing, manpower, parts, depot overhaul costs and module failure tests.

N75-30095/4GA PC$290.50
Engineering Sciences Data Unit, London (England).
Performance Data for the Critical Operation of Nominally Two-Dimensional Double-Ramp Supersonic Intakes.
Jun 75, 40p ESDU-75005
Subm-Sponsored by Roy. Aeron. Soc.

Descriptors: *Air intakes, *Aircraft performance, *Supersonic inlets, *Two dimensional bodies, Engine inlets, Free flow, Graphs (Charts), Inviscid flow.

For abstract, see STAR 1321

N75-30098/8GA PC$3.25
Lyon Univ. (France). Lab. de Mecanique des Fluides.
Influence of Dissipative Phenomena on Turbomachine Performance Influence des Phenomenes Dissipatifs sur les Performances des Turbomachines.
Final Report.
J. Mathieu, and G. Spettel. 1 Oct 74, 14p
Contract DGRST-69-0-1964
Language in French.

Descriptors: *Energy dissipation, *Performance tests, *Subsonic wind tunnels, *Turbomachine blades, Axial flow turbines, Boundary layer flow, Differential equations, Integral equations, Pressure measurements, Secondary flow.

For abstract, see STAR 1321

N75-30162/2GA PC$3.75/MF$2.25
Aeronautical Research Labs., Melbourne (Australia).
The Constant-Volume Gas Turbine-Revision of the Simplified Theoretical Analysis.
J. E. Williams. Feb 75, 42p ARL/ME-NOTE-356

Descriptors: *Combustion efficiency, *Gas turbine engines, Engine design, Performance prediction, Thermodynamics.

For abstract, see STAR 1321

N75-30164/8GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Design and Performance at a Local Mach Number of 6 of an Inlet for an Integrated Scramjet Concept.
C. A. Trexler, and S. W. Souders. Aug 75, 142p NASA-TN-D-7944, L-10000

Descriptors: *Aircraft design, *Intake systems, *Performance tests, *Supersonic combustion ramjet engines, *Wind tunnel models, Aerodynamic configurations, Boundary layers, Cowlings, Leading edges, Shock waves, Throats, Wind tunnel apparatus.

For abstract, see STAR 1321

N75-30165/5GA PC$5.75/MF$2.25
Boeing Commercial Airplane Co., Seattle, Wash.
Experimental Evaluation of a Mach 3.5 Axisymmetric Inlet.
J. Syberg, and J. L. Koncsek. Jul 75, 140p NASA-CR-2563, D6-42494
Contract NAS2-8236

Descriptors: *Internal compression inlets, *Supersonic inlets, *Wind tunnel tests, Boundary layers, Engine design, Inlet flow, Pressure reduction.

For abstract, see STAR 1321

N75-30174/7GA PC$3.25/MF$2.25
New York Univ., N.Y. Aerospace and Energetics Lab.
Hypersonic Engine Airplane Integration.
Progress Report, 1 Feb. - 1 Sep. 1975.
Sep 75, 20p NASA-CR-143376
Contract NGR-33-016-131

Descriptors: *Conductive heat transfer, *Engine tests, *Supersonic combustion ramjet engines, Combustion chambers, Combustion physics, Fuel injection, Inlet flow.

For abstract, see STAR 1321

N75-30175/4GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Experience with Integrally-Cast Compressor and Turbine Components for a Small, Low-Cost, Expendable-Type Turbojet Engine.
R. P. Dengler. 1975, 39p NASA-TM-X-71782, E-8441
Conf-Proposed for Presentation at 1975 Aerospace Eng. And Manuf. Meeting, Los Angeles, 17-20 Nov. 1975; Sponsored by Sae.

Descriptors: *Component reliability, *Engine design, *Turbojet engines, Engine tests, Performance prediction.

For abstract, see STAR 1321

N75-30177/0GA PC$5.25/MF$2.25
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
Experimental Clean Combustor Program Noise Measurement Addendum, Phase 1.
Final Report.
J. J. Emmerling. Jul 75, 113p NASA-CR-134853, GE75AEG315
Contract NAS3-16830

Descriptors: *Combustion chambers, *Engine noise, *Noise measurement, Engine design, Performance tests, Sound pressure, Waveguides.

For abstract, see STAR 1321

N75-30178/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Preliminary Study of the Fuel Saving Potential of Regenerative Turbofans for Commercial Subsonic Transports.
G. A. Kraft. Aug 75, 47p NASA-TM-X-71785, E-8450

Descriptors: *Commercial aircraft, *Engine tests, *Fuel consumption, *Turbofans, Aerodynamic drag, Engine inlets, Heat exchangers, Tables (Data), Turbofan engines.

For abstract, see STAR 1321

N75-30995/5GA PC$7.00/MF$2.25
Bundesministerium der Verteidigung, Bonn (West Germany). Ruestungshauptabteilung.
Contributions from Military Technology Beitraege Aus der Wehrtechnik.
W. Strathmann. 1975, 186p BMVG-FBWT-75-12
In German; English Summaries.

Descriptors: *Fatigue tests, *Germany, *Military technology, *Phased arrays, *Supersonic compressors, Axial flow turbines, Baltic sea, F-104 aircraft, Search radar, Thermal boundary layer, Water temperature.

For abstract, see STAR 1321

21G. Reciprocating Engines

AD-A016 229/7GA PC$12.50/MF$2.25
Army Tank-Automotive Command Warren Mich Foreign Technology Office
Army Vehicle Engines. Part II. Design and Calculation.
6 Aug 75, 544p Rept no. FIO-T-6-74
Unedited trans of unidentified mono., Moscow, 1972. See also part 1, AD-A003 129.

Descriptors: *Army equipment, *Military vehicles, *Internal combustion engines, Diesel engines, Piston engines, Combustion, External combustion engines, Turbines, Rotary combustion engines, Translations, USSR.

This book is the second part of the manual 'Army Vehicle Engines'. In it, consideration is given to the requirements for army vehicle power plants and their parameters. It explains problems of kinematics, dynamics and the equilibration of engines. It carries out an analysis of the design and the basic calculation the crankshaft-connecting rod and the gas distribution mechanism, the fuel feed system, the lubricating and the cooling system. Information is given concerning the material and the technology of engine manufacture.

21H. Rocket Motors and Engines

AD-A015 859/2GA PC$6.25/MF$2.25
Rockwell International Corp Mcgregor Tex Rocketdyne Div
Air Launch Instrumented Vehicles Evaluation (ALIVE) Program.
Interim technical rept. on Phase 1, Program 2, J. D. Burton, and J. E. Williamson. 15 Sep 75, 163p Rept no. R-4901 AFPRL-TR-75-56
Contract F04611-74-C-0009

Descriptors: *Weapon systems, *Air launched, *Solid propellant rocket engines, Accelerated testing, Aging(Materials), Flight testing, Thermal analysis, Solid rocket propellants.
Identifiers: ALIVE program.

The report presents progress to date on Program II of the Air Launch Instrumented Vehicles Evaluation Program (Contract F04611-74-C0009), under which a GFE propellant and three Modular Weapon Instrumented Vehicles prototype motors are being evaluated. An adequate data set for definition of a 5-year service life has been identified. An accelerated test approach based on this service-life definition is presented in detail. The three motors and instrumentation are described, and instrumentation calibration is discussed in detail. Tests conducted to characterize the propellant are described and data obtained are presented. The thermal and structural analyses of the three motors (conducted using the Air Force viscoelastic analysis computer code THVINC) are also presented.

N75-30082/2GA PC$7.50/MF$2.25
Deutsche Gesellschaft fuer Luft- und Raumfahrt, Cologne (West Germany).
Contributions to Fluid Mechanics and Flight Mechanics.
H. Stuemke. 25 Jul 74, 234p DLR-FB-74-62
Partly in English and Partly in German.

Descriptors: *Booster rocket engines, *Flight mechanics, *Fluid dynamics, *Magnetohydrodynamic waves, Blunt bodies, Boundary layer separation, Climbing flight, Finite element method, Method of characteristics, Pitot tubes, Transonic wind tunnels, Wind tunnel models.

For abstract, see STAR 1321

N75-30251/3GA PC$6.25/MF$2.25
Rocket Research Corp., Seattle, Wash.
Monopropellant Engine Investigation for Space Shuttle Reaction Control System, Volume 1.
Final Report.
18 Apr 75, 160p NASA-CR-144415, REPT-75-R-460-VOL-1
Contract NAS8-28950

Descriptors: *Combustion control, *Engine design, *Monopropellants, *Space shuttles, *Thrust control, Hydrazine engines, Performance prediction, Reentry effects, Vibration effects.

For abstract, see STAR 1321

N75-30252/1GA PC$5.75/MF$2.25
Rocket Research Corp., Seattle, Wash.
Monopropellant Engine Investigation for Space Shuttle Reaction Control. Volume 2: Design, Fabrication, and Demonstration Test of a Catalytic Gas Generator for the Space Shuttle Apu.
Final Report.
18 Apr 75, 130p NASA-CR-144416, REPT-75-R-460-VOL-2
Contract NAS8-28950

Descriptors: *Combustion control, *Engine design, *Gas generators, *Space shuttles, *Thrust control, Catalysts, Hydrazine engines, Monopropellants.

For abstract, see STAR 1321

N75-30253/9GA PC$3.75/MF$2.25
Rocket Research Corp., Seattle, Wash.
Monopropellant Engine Investigation for Space Shuttle Reaction Control System. Volume 3: Improvement of Metal Foam for Catalyst Retention.
Final Report.
18 Apr 75, 46p NASA-CR-144417, REPT-75-R-460-VOL-3
Contract NAS8-28950

Descriptors: *Catalysts, *Combustion control, *Engine design, *Metal matrix composites, *Monopropellants, *Space shuttles, *Thrust control, Foams, Gas generators, Hydrazine engines, Nickel, Platinum, Rhodium.

For abstract, see STAR 1321

N75-30468/3GA PC$6.25/MF$2.25
Texas Univ., Austin. Dept. of Aerospace Engineering and Engineering Mechanics.
Characterization of Typical Platelet Injector Flow Configurations.
C. E. Hickox. Aug 75, 162p NASA-CR-144391, REPT-75006
Contract NAS9-13865

Descriptors: *Flow characteristics, *Injectors, *Liquid propellant rocket engines, *Metal plates, Atomizing, Flow geometry, Flow visualization, Orifice flow, Photographs, Scale models, Tables (Data).

For abstract, see STAR 1321

21I. Rocket Propellants

AD-A015 841/0GA PC$7.00/MF$2.25
Aerojet Solid Propulsion Co Sacramento Calif
Flexible Case-Grain Interactions in Ballistic Weapon Systems. Part I. Recovery of Strain Induced Damage in ANB-3066 Propellant. Part II. Viscoelastic Characterization of a Nonlinear Glass/Epoxy Composite Including the Effects of Damage.
Special technical rept. May 72-Dec 74,
Richard J. Farris, and Scott W. Beckwith. May 75, 200p Rept no. ASPC-1953-81SR-2 AFRPL-TR-75-11
Contract F04611-72-C-0055
Prepared in cooperation with Texas A and M Univ., College Station.

Descriptors: *Rocket engine cases, *Solid rocket propellants, *Stress analysis, Loads(Forces), Thermal stresses, Aging(Materials), Creep, Reinforced plastics, Epoxy resins, Viscoelasticity, Strain(Mechanics), Nonlinear systems.
Identifiers: Epoxy matrix materials, Fiberglass reinforced plastics.

In part one, experimental evaluations of previous strain and recovery histories were conducted to determine their influences upon subsequent mechanical property characterizations of solid propellant grains. The purpose of the tests was to determine the effects of motor pressurization and thermal strains. Based on the experimental data contained in this report it is recommended that large propellant blocks from the dissected motor be stored stress-free at room temperature for a period of at least one month. In part two isothermal creep and recovery tests were conducted on an epoxy resin and a glass fiber-reinforced composite made from the same bulk resin. Both the epoxy and glass/epoxy were found to be thermorheologically complex materials with a creep compliance which may be represented by a power law in time.

N75-30326/3GA PC$3.75/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
High Performance N204/Amine Elements: Blowapart.
B. R. Lawver. 15 Nov 74, 43p NASA-CR-141480, REPT-14186-DRL-3-1
Contract NAS9-14186

Descriptors: *Hypergolic rocket propellants, *Injectors, *Separated flow, Impingement, Nozzle design, Parameterization, Scale models, Space tugs.

For abstract, see STAR 1321

PAT-APPL-580 385/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Gossypol, an Abundant, Low-Cost Iron Deactivator, Pot-Life Extender, and Processing Aid for HTPB Propellants.
Patent Application.
John D. Braun, M. Frank Pickett, Howard W. Gerrish, Jr., and Hans Jonassen. Filed 23 May 75, 8p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Additives, *Polymers, *Solid rocket propellant binders, Patents, Phenols, Aldehydes.
Identifiers: *Patent applications, PAT-CL-149-19, *Gossypol, Hydroxy terminated polybutadiene.

Hydroxy terminated polymeric binders are well known and widely used in solid rocket propellants. One example is hydroxy terminated polybutadiene (HTPB). It has now been found, according to the patent application, that gossypol, a naturally occurring, readily available compound, can be used to increase the pot life of HTPB and other hydroxy terminated polymeric binder materials after a curative has been added. Gossypol does this by countering the catalytic effect of the transition metal compounds present.

TID/SNA-1461 PC$9.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Design of a Temperature Measuring System with Resistance Temperature Transmitters for Service in Titan II Storable Propellants.
H. C. Chandon. 29 Mar 63, 121p

Descriptors: (*Propellants, *Temperature measurement), (*Pyrometers, *Design), Liquids, Performance testing, Rockets.

For abstract, see NSA 32 08, number 19836.

22. SPACE TECHNOLOGY

22A. Astronautics

N75-30221/6GA PC$4.75/MF$2.25
Wisconsin Univ., Madison. Space Science and Engineering Center.
Meteorological Measurements from Satellite Platforms.
Annual Scientific Report, 1973-1974.
V. E. Suomi. Mar 75, 93p NASA-CR-144669
Contract NAS5-21798

Descriptors: *Satellite orientation, *Spacecraft stability, *Spin stabilization, *Stochastic processes, Analog simulation, Attitude control, Fokker-planck equation, Rotating bodies.

For abstract, see STAR 1321

N75-30233/1GA PC$3.75/MF$2.25
Aerospace Corp., El Segundo, Calif. Advanced Orbital Systems Div.
Operations Analysis (Study 2.1). Volume 1: Executive Summary.
Final Report.
R. R. Wolfe. 21 Feb 75, 32p NASA-CR-143354, ATR-74(7341)-8-VOL-1
Contract NASW-2575

Descriptors: *Operations research, *Space maintenance, *Space shuttles, Costs, Payloads, Space logistics, Space transportation, Telemetry, Tradeoffs.

For abstract, see STAR 1321

N75-30235/6GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Four Methods of Attitude Determination for Spin-Stabilized Spacecraft with Applications and Comparative Results.
G. A. Smith. Aug 75, 72p NASA-TR-R-445, G-7522

Descriptors: *Attitude (Inclination), *Spin stabilization, Inertial navigation, Least squares method, Star trackers.

For abstract, see STAR 1321

N75-30570/6GA PC$10.25/MF$2.25
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
The 9TH Aerospace Mechanisms Symposium.
Aug 75, 387p NASA-TM-X-3274
Conf-Symp. Held at Cocoa Beach, Fla., 17-18 Oct. 1974.

Descriptors: *Aerospace engineering, *Aerospace systems, *Conferences, Aerospace medicine, Aerospace vehicles, Life support systems, Mechanical engineering, Space laboratories, Spacecraft configurations, Spacecraft lubrication.

For abstract, see STAR 1321

22B. Spacecraft

N75-30234/9GA PC$13.25/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Aerodynamic Results of a Separation Effects Test (IA87) on a 0.01-Scale Model (52-Ots) of the Integrated Ssv in the AEDC/Vkf 40-by-40 Inch Supersonic Wind Tunnel a, Volume 2.
J. H. Campbell, Ii. Jun 75, 583p NASA-CR-141542, DMS-DR-2192-VOL-2
Contract NAS9-13247

Descriptors: *External stores, *Space shuttle orbiters, *Supersonic wind tunnels, *Wind tunnel tests, Aerodynamic configurations, Performance tests, Scale models, Stage separation, Tables (Data).

For abstract, see STAR 1321

N75-30237/2GA PC$15.25/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of Investigations on an 0.015-Scale Model (49-0) of the Rockwell International Space Shuttle Orbiter in the NASA-Ames Research Center 3.5-Foot Hypersonic Wind Tunnel (0A98).
M. D. Milam, and T. J. Dzuibala. Jul 75, 746p NASA-CR-141550, DMS-DR-2167
Contract NAS9-13247

Descriptors: *Graphs (Charts), *Hypersonic wind tunnels, *Scale models, *Space shuttle orbiters, Aerodynamic forces, Angle of attack, Base pressure, Data reduction, Static pressure, Tables (Data).

For abstract, see STAR 1321

N75-30238/0GA PC$2.25/MF$2.25
Chrysler Corp., New Orleans, La. Data Management Services.
Aerodynamic Results of a Separation Effects Test Conducted in the AEDC 40 by 40 Inch Tunnel a Facility on the Rockwell International Launch Configuration 3 (Model-Ots) Integrated Vehicle (IA13), Volume 1.
J. H. Campbell, Ii. Jul 75, 958p NASA-CR-134117, DMS-DR-2062-VOL-1
Contract NAS9-13247
Seri-3.

Descriptors: *External stores, *Launch vehicle configurations, *Space shuttle boosters, *Space shuttle orbiters, *Stage separation, Graphs (Charts), Scale models, Tables (Data), Wind tunnel tests.

For abstract, see STAR 1321

N75-30239/8GA PC$15.25/MF$2.25
Chrysler Corp., New Orleans, La. Data Management Services.
Aerodynamic Results of a Separation Effects Test Conducted in the AEDC 40 by 40 Inch

Tunnel a Facility on the Rockwell International Launch Configuration 3 (Model 32-Ots) Integrated Vehicle (IA13), Volume 2.
J. H. Campbell, Ii. Jul 75, 668p NASA-CR-134118, DMS-DR-2062-VOL-2
Contract NAS9-13247
Seri-3.

Descriptors: *External stores, *Launch vehicle configurations, *Space shuttle boosters, *Space shuttle orbiters, *Stage separation, Graphs (Charts), Tables (Data), Wind tunnel tests.

For abstract, see STAR 1321

N75-30240/6GA PC$15.25/MF$2.25
Chrysler Corp., New Orleans, La. Data Management Services.
Aerodynamic Results of a Separation Effects Test Conducted in the AEDC 40 by 40 Inch Tunnel a Facility on the Rockwell International Launch Configuration 3 (Model 32-Ots) Integrated Vehicle (IA13), Volume 3.
J. H. Campbell, Ii. Jul 75, 651p NASA-CR-141801, DMS-DR-2062-VOL-3
Contract NAS9-13247
Seri-3.

Descriptors: *External stores, *Launch vehicle configurations, *Space shuttle boosters, *Space shuttle orbiters, *Stage separation, Graphs (Charts), Tables (Data), Wind tunnel tests.

For abstract, see STAR 1321

N75-30241/4GA PC$4.75/MF$2.25
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
A Leading Edge Heating Array and a Flat Surface Heating Array: Final Design.
Final Report, 26 Jun. 1974 - 10 Jul. 1975.
10 Jul 75, 97p NASA-CR-144390, MDC-E1232
Contract NAS9-14041

Descriptors: *Fuselages, *Heat radiators, *Leading edges, *Space shuttles, *Test equipment, *Thermal protection, Aerodynamic heating, Atmospheric entry, Graphite, Heat transfer.

For abstract, see STAR 1321

N75-30242/2GA PC$4.25/MF$2.25
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
Space Shuttle Orbiter Mechanical Refrigeration System.
Final Report.
J. L. Williams. 14 Oct 74, 53p NASA-CR-144395, T122-RP-038
Contract NAS9-12055

Descriptors: *Refrigerating machinery, *Space shuttle orbiters, Condensers (Liquifiers), Flow velocity, Weightlessness.

For abstract, see STAR 1321

N75-30243/0GA PC$6.25/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y. School of Engineering.
Analysis and Design of a Capsule Landing System and Surface Vehicle Control System for MARS Exploration.
Progress Report, 1 Jul. 1974 - 30 Jun. 1975.
D. G. Gisser, D. K. Frederick, P. K. Lashmet, G. N. Sandor, and C. N. Shen. 30 Jun 75, 167p NASA-CR-143374, RPI-TR-MP-48
Contract NGL-33-018-091

Descriptors: *Mars probes, *Mars surface, *Roving vehicles, *Spacecraft control, *Spacecraft design, Automatic control, Dynamic characteristics, Navigation aids, Remote control.

For abstract, see STAR 1321

N75-30244/8GA PC$8.75/MF$2.25
Martin Marietta Corp., Denver, Colo.
Ss/Rcs Surface Tension Propellant Acquisition/Expulsion Tankage Technology.
Final Report.
Aug 75, 278p NASA-CR-144412, MCR-75-171
Contract NAS9-13709

Descriptors: *Design analysis, *Interfacial tension, *Liquid rocket propellants, *Performance tests, *Propellant storage, *Propellant tanks, *Space shuttles, Compartments, Engineering drawings, Fuel tank pressurization, Fuel tanks, Liquid sloshing, Photographs, Scale models, Spherical tanks.

For abstract, see STAR 1321

N75-30245/5GA PC$5.75/MF$2.25
Martin Marietta Corp., Denver, Colo.
Lightweight Thermally Efficient Composite Feedlines for the Space Tug Cryogenic Propulsion System.
Final Report, Aug. 1973 - May 1975.
D. E. Spond. Aug 75, 127p NASA-CR-134870, REPT-04236
Contract NAS3-17796

Descriptors: *Cryogenic rocket propellants, *Feed systems, *Space tugs, *Spacecraft propulsion, Cost analysis, Design analysis, Performance prediction, Propulsion system performance, Storable propellants, Thermal control coatings.

For abstract, see STAR 1321

N75-30247/1GA PC$6.25/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of Investigations on a 0.010-Scale 140A/B Configuration Space Shuttle Vehicle Orbiter Model 72-0 In the NASA/Langley Research Center Continuous Flow Hypersonic Tunnel (OA90).
P. J. Hawthorne. Aug 75, 162p NASA-CR-141805, DMS-DR-2149
Contract NAS9-13247

Descriptors: *Continuum flow, *Hypersonic wind tunnels, *Space shuttle orbiters, *Wind tunnel tests, Angle of attack, Directional stability, Graphs (Charts), Longitudinal stability, Scale models.

For abstract, see STAR 1321

N75-30249/7GA PC$5.75/MF$2.25
Rocketdyne, Canoga Park, Calif.
Orbital Maneuvering Engine Feed System Coupled Stability Investigation.
D. R. Kahn, M. D. Schuman, J. K. Hunting, and K. W. Fertig. 1 Sep 75, 143p NASA-CR-144409, R-9807
Contract NAS9-14315

Descriptors: *Combustion stability, *Coupled modes, *Feed systems, *Orbit maneuvering engine (Space shuttle), Combustion chambers, Combustion physics, Hydrodynamics.

For abstract, see STAR 1321

N75-30250/5GA PC$7.25/MF$2.25
AiResearch Mfg. Co., Torrance, Calif.
H2O2 Space Shuttle Apu.
Final Report.
29 Apr 75, 222p NASA-CR-134784, AIRESEARCH-75-11290
Contract NAS3-15708

Descriptors: *Auxiliary power sources, *Space shuttles, *Spacecraft power supplies, Cryogenics, Exhaust flow simulation, Fuel consumption, Propellant combustion, Propulsive efficiency.

For abstract, see STAR 1321

N75-30918/7GA PC$3.75/MF$2.25
Aerospace Corp., El Segundo, Calif. Advanced Orbital Systems Div.
System Cost Performance Analysis (Study 2.3). Volume 1: Executive Summary.
Final Report.
B. H. Campbell. 27 Sep 74, 34p NASA-CR-143367, ATR-74(7343)-VOL-1
Contract NASW-2575

Descriptors: *Cost analysis, *Mathematical models, *Project planning, *Systems analysis, *Unmanned spacecraft, Computer programs, Performance prediction, Reliability analysis, Safety management.

For abstract, see STAR 1321

N75-30919/5GA PC$12.25/MF$2.25
Aerospace Corp., El Segundo, Calif. Advanced Orbital Systems Div.
Systems Cost/Performance Analysis (Study 2.3). Volume 2: Systems Cost/Performance Model.
Final Report.
B. H. Campbell. 27 Sep 74, 523p NASA-CR-143368, ATR-74(7343)-1-VOL-2
Contract NASW-2575

Descriptors: *Cost analysis, *Mathematical models, *Project planning, *Systems analysis, *Unmanned spacecraft, Computer programs, Digital computers, Performance prediction, Reliability analysis, Safety management, Systems engineering.

For abstract, see STAR 1321

N75-30920/3GA PC$10.25/MF$2.25
Aerospace Corp., El Segundo, Calif. Advanced Orbital Systems Div.
Systems Cost/Performance Analysis (Study 2.3). Volume 2, Appendix a: Data Base.
Final Report.
B. H. Campbell. 27 Sep 74, 383p NASA-CR-143369, ATR-74(7343)-1-VOL-2-APP
Contract NASW-2575

Descriptors: *Cost analysis, *Data bases, *Mathematical models, *Systems analysis, *Unmanned spacecraft, Performance prediction, Project planning, Safety management, Schedules, Systems engineering, Tables (Data).

For abstract, see STAR 1321

N75-30921/1GA PC$13.25/MF$2.25
Aerospace Corp., El Segundo, Calif. Advanced Orbital Systems Div.
Systems Cost/Performance Analysis (Study 2.3). Volume 3: Programmer'S Manual and User'S Guide.
Final Report.
R. F. Janz. 27 Sep 74, 592p NASA-CR-143377, ATR-74(7343)-1-VOL-3
Contract NASW-2575

Descriptors: *Cost analysis, *Mathematical models, *Unmanned spacecraft, *User manuals (Computer programs), Computer programming, Data bases, Design analysis, Performance prediction, Subroutines, Systems engineering.

For abstract, see STAR 1321

22C. Spacecraft Trajectories and Reentry

AD-A015 811/3GA PC$5.75/MF$2.25
Royal Aircraft Establishment Farnborough (England)
The SKYNET2 Events, Prediction Program EVENTS2.
Technical rept.,
G. J. Davison. Apr 75, 142p Rept no. RAE-TR-75029 DRIC-BR-47513

Descriptors: *Communication satellites, *Orbits, *Computer programs, Apogee, Perigee, Satellite tracking systems, Mathematical models, FORTRAN, Great Britain.
Identifiers: Skynet satellites, Skynet 2 satellite, EVENTS2 computer program.

A detailed description is given of the EVENTS2 program, which is used to provide predictions of conjunction and eclipse times for the SKYNET2 spacecraft.

AD-A015 848/5GA PC$3.25/MF$2.25
Royal Aircraft Establishment Farnborough (England)
Launch Window for the X4 Satellite on a Scout Rocket.
Technical rept.,
G. E. Cook. Jul 72, 22p Rept no. RAE-TR-72128 DRIC-BR-29693

Descriptors: *Scientific satellites, *Circular orbits, Satellite attitude, Launch vehicles, Launching sites, Stochastic processes, Computer programming.
Identifiers: X-4 satellite, Scout, *Launch window.

On the basis of the preliminary Scout trajectory plan, a launch window is defined for the revised X4 mission, which uses an Algol III Scout to inject the satellite into a nominally circular orbit at a height of 750 km. The effects of launch vehicle injection errors are taken into account using a stochastic simulation method.

N75-30222/4GA PC$13.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Space Indicator: Optical Studies of the Atmosphere.
A. M. Obukhov, and V. M. Kovtunenko. Aug 75, 566p NASA-TT-F-16265
Contract NASW-2481
Tran-Transl. Into English from the Book "Kosmicheskaya Strela: Opticheskiye Issledovaniya Atmosfery" Moscow, Nauka Press, 1974 p 1-327.

Descriptors: *Atmospheric optics, *Bibliographies, *Scientific satellites, Earth atmosphere, Orbit calculation, Satellite design, Satellite instruments, Satellite observation, Satellite orbits, Solar radiation.
Identifiers: Translations.

For abstract, see STAR 1321

N75-30541/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Satellite Laser Ranging Work at the Goddard Space Flight Center.
T. E. Mcgunigal, W. J. Carrion, L. O. Caudill, C. R. Grant, and T. S. Johnson. Jul 75, 15p NASA-TM-X-70948, X-723-75-172
Subm-Submitted for Publication. Conf-Presented at Western Elec. Show and Convention (Wescon 75), San Francisco, 16-19 Sep. 1975.

Descriptors: *Laser range finders, *Pulsed lasers, *Satellite tracking, Computer systems design, Performance prediction, Ruby lasers, Systems analysis, Systems engineering.

For abstract, see STAR 1321

N75-30703/3GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Gravitational Harmonics from Shallow Resonant Orbits.
C. A. Wagner, and S. M. Klosko. Jul 75, 50p
NASA-TM-X-70953, X-921-75-187
Subm-Submitted for Publication. Conf-Presented at the Fall Annual Meeting of the American Geophysical Union, San Francisco, Calif.

Descriptors: *Geos 2 satellite, *Gravitation, *Harmonics, *Orbit calculation, *Resonance, *Satellite orbits, Equations of motion, Error analysis, Kepler laws, Orbit perturbation, Perigees.

For abstract, see STAR 1321

22D. Spacecraft Launch Vehicles and Ground Support

N75-30246/3GA PC$7.25/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of Aerothermodynamic Heating Tests on a 0.013-Scale Model Solid Rocket Booster in the NASA/Larc Unitary Plan Wind Tunnel (Sh12f).
E. B. Brewer. Jul 75, 224p NASA-CR-141802, DMS-DR-2216
Contract NAS9-13247

Descriptors: *Aerodynamic heat transfer, *Solid propellant rocket engines, *Space shuttles, *Wind tunnel tests, Angle of attack, Reentry physics, Scale models, Tables (Data).

For abstract, see STAR 1321

N75-30479/0GA PC$7.00/MF$2.25
General Dynamics/Convair, San Diego, Calif.
Centaur Propellant Acquisition System Study.
Final Report, 9 Jan. 1974 - 25 May 1975.
M. H. Blatt, and M. D. Walter. Jun 75, 200p
NASA-CR-134811, CASD-NAS-75-023
Contract NAS3-17802

Descriptors: *Centaur launch vehicle, *Propellant transfer, *Propulsion system configurations, Design analysis, Feed systems, Fluid flow, Fuel tanks, Systems engineering.

For abstract, see STAR 1321

PAT-APPL-472 559/GA PC$3.25/MF$2.25
Department of the Navy Washington D C
Space Shuttle Orbiter Barricade.
Patent Application,
Perry R. Digiovanniantonio. Filed 23 May 74, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Space shuttles, *Arresting gear, Patents, Aerospace planes, Aircraft landings, Barriers, Nylon, Straps.
Identifiers: *Patent applications.

The patent application relates to a barricade installation for arresting the motion of a winged space vehicle comprising four rectangular loops of heavy duty nylon rope commonly attached at each corner to a pair of stanchions by tensioning pendants, and at opposite vertical sides to a pair of arresting engines. A plurality of vertical, nylon engaging straps are positioned between top and bottom horizontal ropes at finite intervals along the length thereof in step-wise fashion. Upon engagement of the vertical straps by the vehicle, the rectangular loops break away from the stanchions and move in the direction of forward motion of the vehicle, and loading on the vehicle frame and wing assemblies is equalized during arrestment as the vertical straps are free to move relative to the horizontal ropes.

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